

10th Grade  
Lesson Plan  
Packet

4/13/2020-4/17/2020

## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13 - April 17, 2020**

**Course:** 10 Art

**Teacher(s):** Ms. Frank [clare.frank@greatheartsirving.org](mailto:clare.frank@greatheartsirving.org)

### **Weekly Plan:**

Monday, April 13

- Review the information and drawings on the nose and the mouth.
- Turn back to your self-portrait from last week. Develop the mouth and adjoining areas with careful attention to intersecting planes, convex and concave surfaces.

Tuesday, April 14

- Read over the information about the anatomy of the eye.
- Turn to your self-portrait. Lightly sketch your eyes, working from general to specific.

Wednesday, April 15

- Continue developing your eyes in your drawing, being attentive to the anatomy.
- Develop contours and shading of eye cavity, brow, cheekbone and temples.

Thursday, April 16

- Texture exercises to imply hair.

Friday, April 17

- Develop the forehead, hairline, and hair.
- Develop the range of value in your self-portrait, with particular attention to planes, shifts in value along contours, and varied levels of contrast.

### **Statement of Academic Honesty**

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently.

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Student Signature

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Parent Signature

*For all assignments in art this week use a pencil and your sketchbook. Keep a piece of clean folded paper handy to place below your hand as you draw to prevent smudging. Each day's assignment is designed to take about 20 minutes for the average student to complete. Encourage yourself to observe keenly and draw beautifully.*

*The text resource for this week is "Drawing the Human Head" by Burne Hogarth. Select pages are in the attached resources; the packets from the last two weeks will also be useful as a reference. The text and diagrams give good general guidelines for proportions and measurements, but amongst us there are individual variations. Remember that cultural ideals and mass media tend to influence what and how we see. Use keen observational skills to draw truthfully and dispassionately.*

*Observational drawing will be done from real life, in real time, from a wall or hand-held mirror. It may be easiest to draw in front of a bathroom mirror. It is key that you are truly drawing from a mirror, not from a smartphone/tablet video or photo of yourself.*

## **Monday, April 13**

1. Review the information and drawings on the nose and the mouth (p. 3-5)
2. Turn to the self-portrait you began last week. Working in front of the mirror, develop your mouth and adjoining areas with careful attention to intersecting planes, convex and concave surfaces.
  - Noting that the bottom contour of the bottom lip is approximately half-way between the base of the nose and the chin, first establish the bottom lip and the corners of the mouth.
  - Next develop the upper lip; note the creases from the corner of your nostrils down your mouth barrel. Note also the philtrum and the septal cartilage.
  - Note the contours and convex and concave surfaces in the lips, the mouth barrel, and chin box. Use shading with a hint of planar analysis to develop these features.

## **Tuesday, April 14**

1. Read over the information about the anatomy of the eye (p. 6-8)
2. Turn to your self-portrait. Lightly sketch your eyes, working from general to specific.
  - Attending to distance between the eyes and placement within the eye cavity under the brow ridge, lightly sketch the curves of your upper and lower eyelids, seeing each as a shape. Note the negative shapes between the lids and the brow, nose ridge and cheek bone.
  - Lightly sketch in the shape of the iris and pupil, attending to the negative shape of the white of your eye.
  - Continue drawing, and once your eyes are well developed introduce a little shading.

## Wednesday, April 15

1. (10-15 min) Continue developing your eyes in your drawing, being attentive to the anatomy.
2. (5-10 min.) Develop contours and shading of eye cavity, brow, cheekbone and temples.
  - Use light lines to further mark out contours and planes.
  - Continue checking proportions and measurements as you draw. Horizontal and vertical alignment of features is useful.
  - Build up values from very light to medium values. Avoid dramatically dark values for now.

## Thursday, April 16

1. Look on page 9 in the supplemental materials and read over the section about texture.
2. Draw a 4- or 6-part grid, and fill each segment with the drawn texture of hair. You may draw from your own, from that of people in your household, or from examples in the supplemental materials. Just draw the hair - fill the cell with the texture patterns - and don't worry about the person's face.



## Friday, April 17

1. Turn to your self-portrait, and develop the forehead, hairline, and hair. As you work, keep an eye on proportions, horizontal and vertical alignment of markers (think anchors or landmarks), and shape.
2. Develop the range of value in your self-portrait, with particular attention to planes, shifts in value along contours, and varied levels of contrast. \*\*\* Don't rush - we'll continue next week. \*\*\*
  - You should have a wide range of value, with least 6 distinct levels of value.
  - Be sparing in your use of white and black. Only the brightest areas should be white - high reflection, perhaps - and only the darkest shadows in the darkest areas should be black.
  - There should be areas where the transition between values is gradual, and areas where the change is more abrupt.
  - You should have a wide range of value contrast. Make sure to have areas of very low, medium, and high value contrast.
  - Use value contrast and transitions or gradations to imply contours; avoid actual outlines.

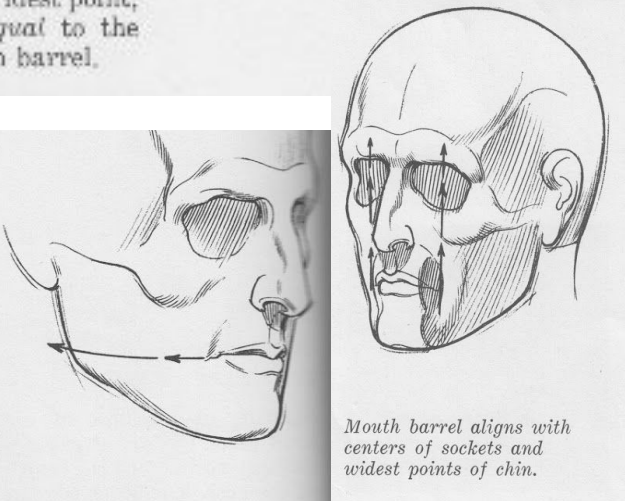
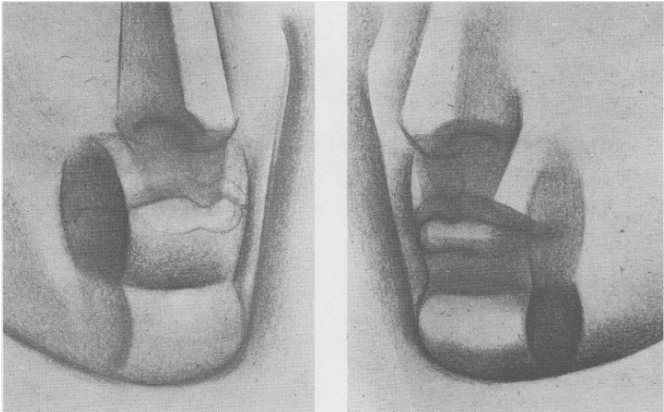
**Supplemental Materials:**

As last week, your most important resource this week is your own head, as seen in a mirror. The mirror may be wall-mounted, propped on a table, or hand-held, the first two being preferable. Last week's packet gave some helpful general advice.

Your resource of next importance are the excerpts from the book Drawing the Human Head by Burne Hogarth, published by Watson Gupstill Publications in 1989 and copyrighted in 1965 by Burne Hogarth. The excerpts in this week's packet build upon those from the week of April 6th.

Proportions and Measurements, from Hogarth, pages 32-34:

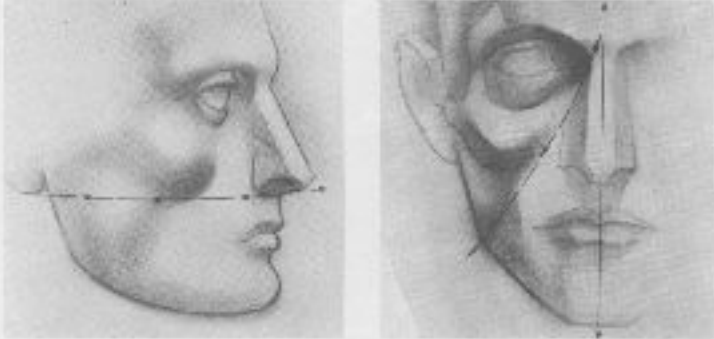
<b>MOUTH BARREL</b>	<b>CHIN BOX</b>	<b>JAW CORNER</b>
Starting at the nose base, the mouth barrel extends <i>two thirds</i> the distance down from the nose to the chin. The sides of the barrel align with the centers of the eye sockets.	Projecting from under the mouth barrel, the chin extends one third the distance upward to the nose. At its widest point, the chin box is <i>equal</i> to the width of the mouth barrel.	The angle of the lower jaw aligns with the lower lip of the mouth barrel.



*Mouth barrel aligns with centers of sockets and widest points of chin.*

**CHEEK BONE**

The base line of the cheek bone aligns with the base of the nose. In frontal views, the inner depression of the cheek bone is roughly midway along a diagonal line (30 degrees) from the eye socket to the angle of the jaw.



*Cheek bone aligns with base of nose.*

*Cheek bone depression is midway on diagonal line.*

Mouth Forms, from Hogarth, pages 46-48:

**Mouth**

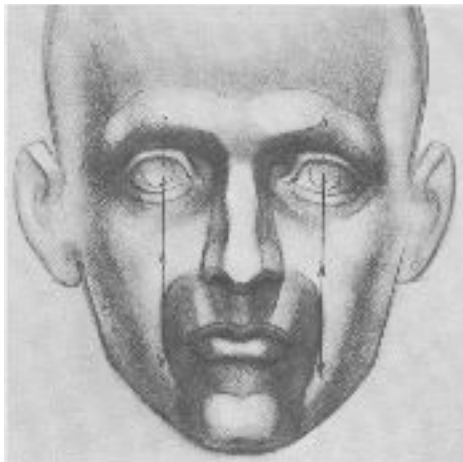
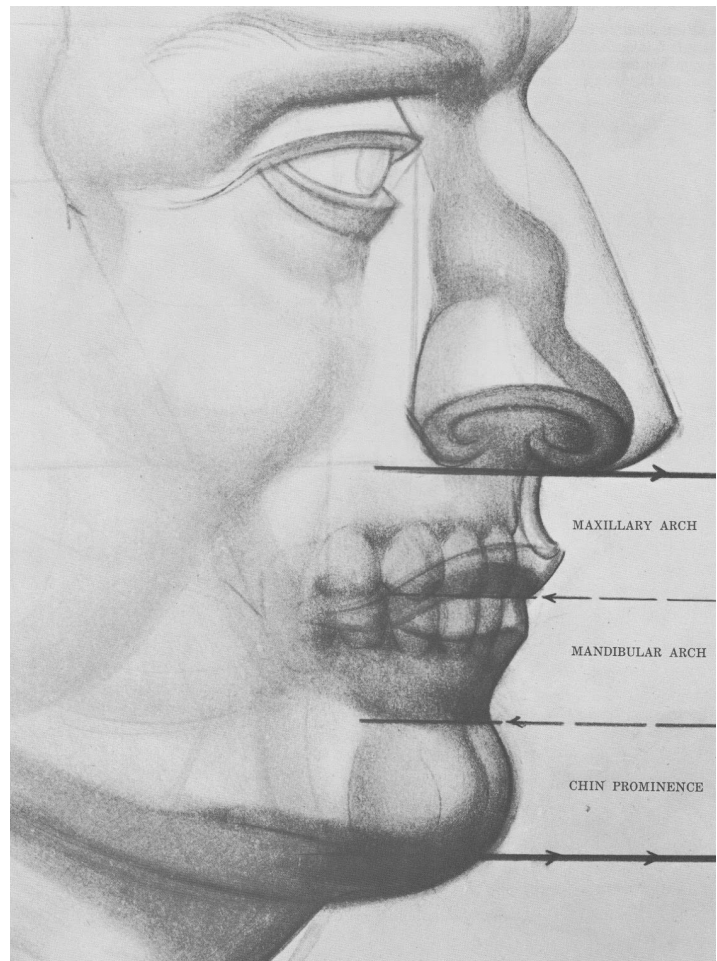
The substructure of the mouth is formed by the two great dental arches of the teeth: the upper (*maxillary*) arch and the lower (*mandibular*) arch. Set together, both arches support the curving mouth barrel.

**SIDE VIEW PROPORTIONS OF MOUTH**

From the base of the nose, the mouth bulge drops two thirds the distance from nose to chin.

**FRONT VIEW PROPORTIONS OF MOUTH**

The outermost points of the dental curve align with the centers of the eye sockets.

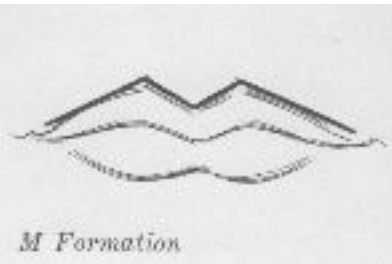


**LIPS**

Overlying the arches of the upper and lower jaws is the broad, circular mouth muscle (*orbicularis oris*), with its prominently developed lip formations.

**UPPER LIP**

The upper lip is a widespread, gently curving arch, grooved in the center with a shallow depression. It is shaped like a flattened, extended M.



Mouth Forms, from Hogarth, pages 49-50:

TUBERCLE

The center of the groove (*tubercle*) on the lip thrusts slightly forward like the prow of a ship.



PHILTRUM

The central depression of the upper lip (*philtrum*) mounts and narrows at the septal cartilage in the base of the nose. The two edges of the philtrum are the *pillars* of the lip.



LOWER LIP

The lower lip contour is like an extended W. Two elliptical lobes develop outward from the center to form the arms of the W, while the middle of the lip dips to receive the tubercle from above. Both lips have thin marginal rims.



*W Formation*



COMPARISON OF UPPER AND LOWER LIPS

The upper lip is somewhat more arched and wider than the lower. Because it covers the greater dental arch of the upper teeth, the upper lip is the longer of the two. The lower lip is therefore recessed on the arch of the lower row of teeth. It is recessed 30 degrees in relation to the upper lip.

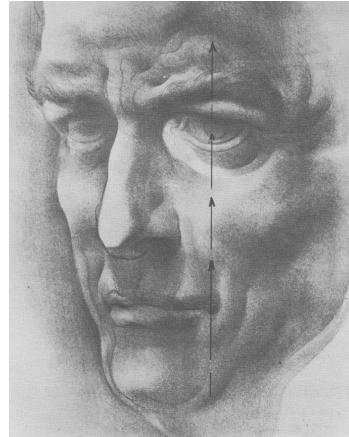
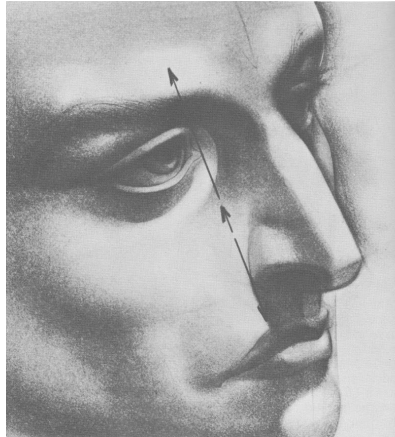


*Upper lip is wider, more arched.*

Checking Placement and Proportion, from Hogarth, pages 61, 76-79:

EYE PLACEMENT

To place the eye correctly in its socket, draw a line upward from the edge of the nostril wing to the brow. The inside corner of the eye starts from this line.

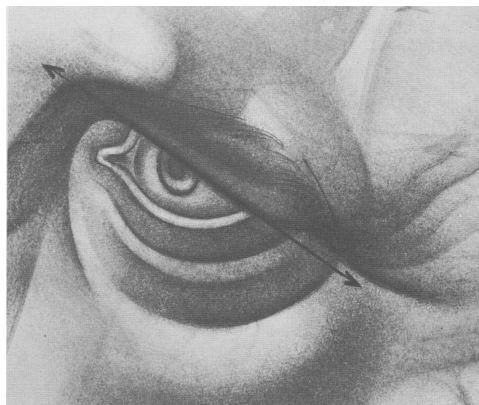


MOUTH AND CHIN

The corner of the mouth holds to a line drawn down from the center of the eye. This line also identifies the side of the chin.

EYE FORM

The eye, in upshot and downshot, shows two remarkably different curves. Here, when the eye is seen from above, the lower lid curve is round, while the upper lid is hardly curved, almost a straight line. When the eye is seen from below (see facing page), the appearance is reversed. The upper lid is greatly curved, and the lower lid is flat.



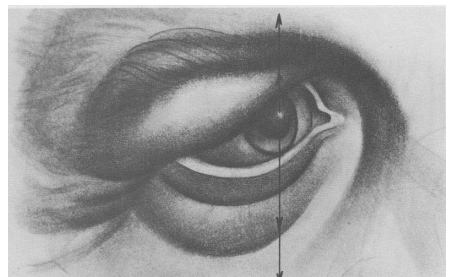
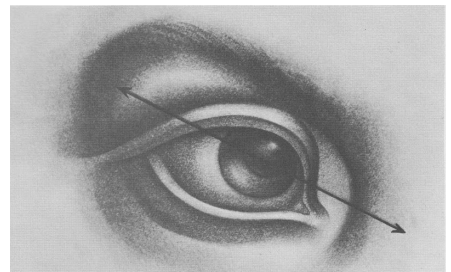
EYE PUPILS

Study the pupils of the eyes, both in up and down views, and in rotating views of the head. In these positions, the eye pupil disc is an *ellipse*, a circle in perspective. In a *front view*, when the eye moves up or down, the ellipse is *horizontal*: shallow from top to bottom. In a *partial side view*, the ellipse is *vertical*: shallow from left to right.

*Up view: pupil is horizontal ellipse.*

*Down view: pupil is horizontal ellipse.*

*Partial side view: pupil is vertical ellipse.*





Refinement of Features: Eye, from Hogarth, pages 36-37:

**REFINEMENT  
OF FEATURES**

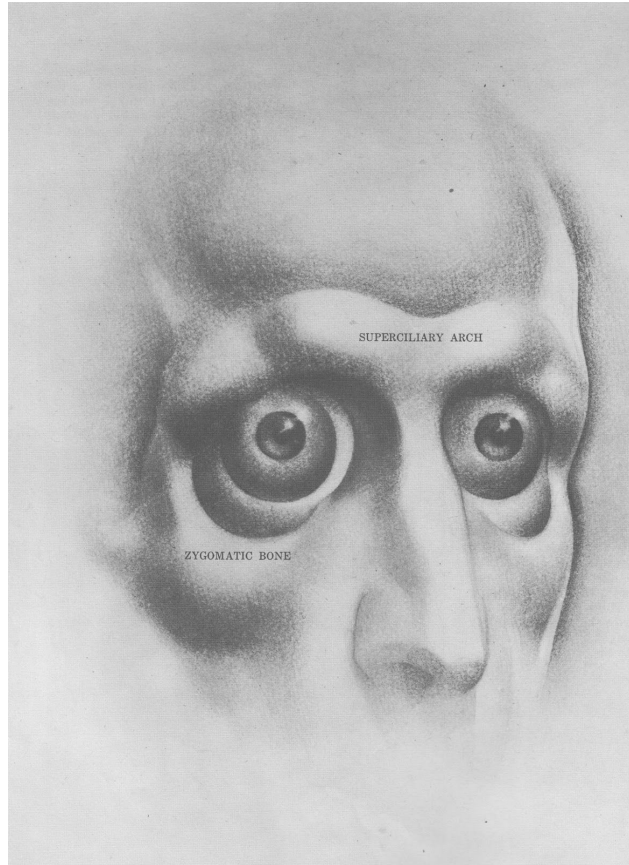
Among the nine feature forms, four have a more complex and involved quality: the eye, nose, mouth, and ear. Two of these are carried to a new phase of form development. Examining the mouth bulge, we shall observe the special quality of the fleshy cover, the *lips*. Drawing the eye socket, we must consider the *eyeball* and the *eyelids*.

**Eye**

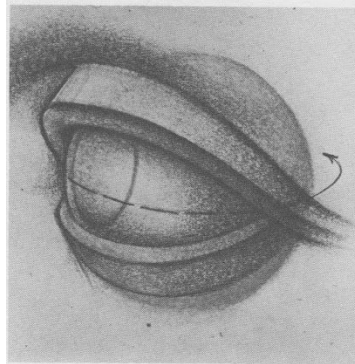
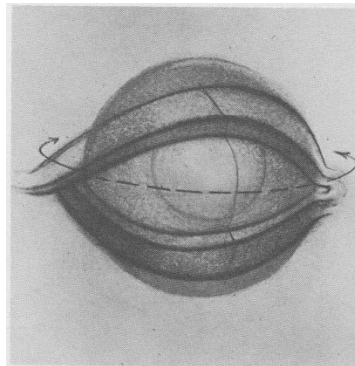
Almost spherical and about one inch in diameter, the eyeball lies within the deep cavity (the orbit) of the eye, cushioned in fatty tissue and situated partly to the front of the socket opening. On all sides of the socket rim, the eye is protected by great projecting structures of bone: the high *nasal bone* to the inside; the overhanging brow ridge (the *superciliary arch*) above and to the outside; the protruding cheek mound (the *zygomatic bone*) below.

**EYELIDS**

The eye may be conceived as a partially exposed internal organ of the body. Covering the exposed bulge of the eyeball are the upper and lower eyelids. The upper lid is more active and moveable than the lower. It is also the larger of the two lids and more fully curved. The wider arc of the upper lid swings around the eyeball at its equatorial middle. The lower lid curves around a small arc at the base of the eyeball.



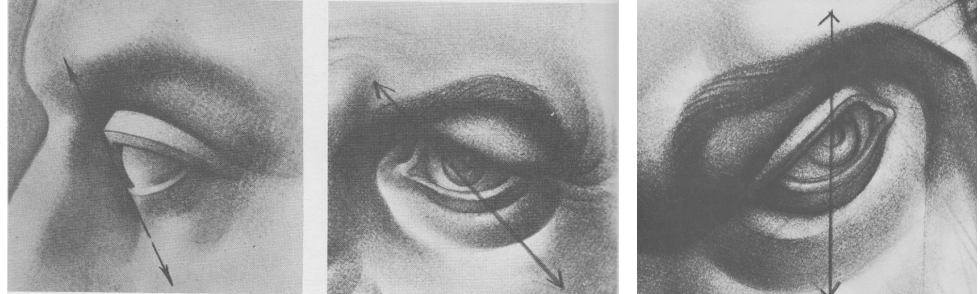
Say what?!?



Refinement of Features: Eye, from Hogarth, pages 38-41:

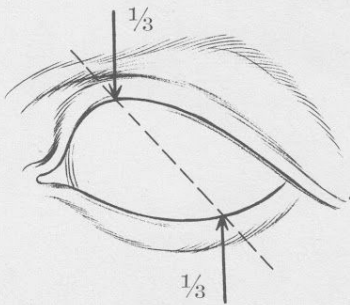
SIDE VIEW OF EYELIDS

The greater curve of the upper lid and smaller curve of the lower lid are more clearly seen from a three-quarter or side view of the eye. Note that the lower lid lies on a backward slope of *45 degrees* from the outthrust upper lid.



SHAPE OF EYE

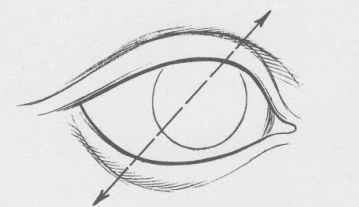
The highest point of the curve of the upper lid is close to the *inside* corner of the eye, approximately one third of an eye-width away. The low point of the lower lid is one third of an eye-width from the *outside* corner.



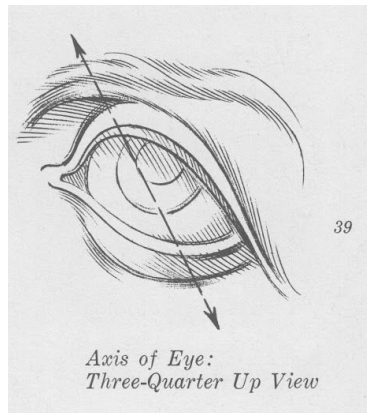
High and Low Points of Eye

AXIS OF EYE

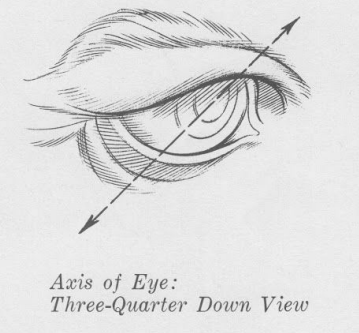
These points, joined with a line, show the oblique *axis* of the eye. The eye opening is *not* a symmetrical almond shape.



Axis of Eye



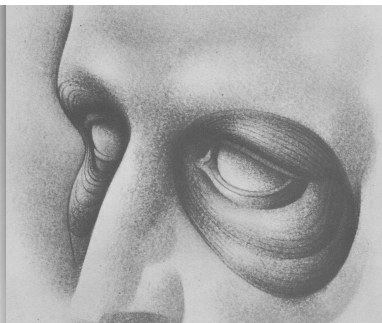
Axis of Eye:  
Three-Quarter Up View



Axis of Eye:  
Three-Quarter Down View

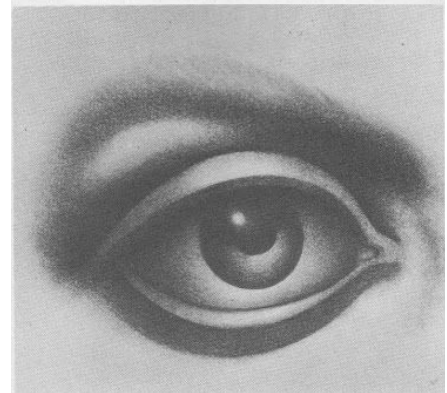
EYE MUSCLE FORMATION ►

Surrounding the entire eye is a large, widespread, oval muscle: the *orbicularis oculi*. It consists of two parts: the *orbital* part, which encircles the entire eye socket from the brow ridge down to the middle cheek bone; and the *palpebral* part, the eyelids, which encase the eye itself. Both parts of the orbicularis muscle close the eye by compression. The greater orbital part vigorously contracts the region around the socket, while the eyelids curtain the eye briskly but gently.



PLACEMENT OF PUPIL

With these curves in place, the *pupil* of the eye appears suspended from under the upper lid, and slightly above the rim of the lower lid.



**Texture: An Element of Art?** Texture is the art element that evokes your sense of touch. It's tactile.

As an element of art, there is something odd about texture. It's rather obviously an element of art in 3D art, where the materials themselves are textural. Imaging a chair, the back and seat of which is made from the chunky bark of an oak tree, or a checkerboard which, instead of alternating dark and light brown wood, alternates polished stainless steel with the fur of a beaver. Okay, yes. But how is it a 2D element? In 2D art texture usually is implied; it is the effect of pattern and variation, with value, lines, shapes and dots. In drawing it takes elements of art and principles of design working together to make texture.

*We will compromise and consider texture an element of art.*

In drawing hair you will be implying texture, using line, shape, value and pattern. Basically you break the hair into chunks based on direction or value, and then you work with line, direction and value within those chunks. For example:



## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13-17, 2020**

**Course:** 10 Chemistry

**Teacher(s):** Ms. Oostindie [megan.oostindie@greatheartsirving.org](mailto:megan.oostindie@greatheartsirving.org)

### Weekly Plan:

Monday, April 13

- Read and record notes for sections 10.1-10.3 (pp.293-298)
- Complete the Common Acids and Bases chart

Tuesday, April 14

- Complete Acids and Bases packet questions 1-10

Wednesday, April 15

- Complete Acids and Bases packet questions 11-22

Thursday, April 16

- Read and record notes for sections 10.4-10.5 (pp.298-301)
- Complete Acid-Base Reactions worksheet

Friday, April 17

- Grade Acid-Base Reactions worksheet
- Acid and Base Reactions Lab

### Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature

Greetings, chemistry students. This week we will be starting chapter 10: acids and bases. We will also be self-grading work again this week. I want to stress the importance of making an honest attempt at the work before looking to the answer key. You must first challenge yourself to try and solve the problem with your current knowledge before you look to see how it was accomplished. Scores for these assignments will be based on effort, both effort in your first attempt and in grading the assignment. This self-grading system does rely on your honesty, but it was chosen so that you can receive immediate feedback on your work and that you may learn from your mistakes. The only person you will harm in the process of copying directly from the answer key is yourself. I miss you all and hope to see you (in digital form) soon.

### **Monday, April 13**

Read sections 10.1-10.3 (pp. 293-298). Take notes of the key vocabulary terms and their definitions as well as any diagrams, equations, and worked examples. Do not answer the questions in yellow boxes. Notes can be taken in a notebook or on separate paper.

For section 10.2, use the attached Common Acids and Bases chart to record your notes. The column titled “Strong or weak?” will be left blank until you complete your readings on Thursday.

### **Tuesday, April 14**

Complete questions 1-10 in the attached Acids and Bases packet. This should be done without reference to your textbook and notes. Use only the information provided in the packet. Answer the questions in complete sentences in your notebook. Questions from today are to become a part of your chapter 10 notes.

### **Wednesday, April 15**

Complete questions 11-22 in the attached Acids and Bases packet. Only use the information in the packet to answer your questions, do not reference your notes or textbook. Answer in complete sentences unless you are supplying chemical reactions or formulas. Use a new sheet of paper. Clearly label your responses. Questions from today will be turned in.

### **Thursday, April 16**

Read sections 10.4-10.5 (pp. 298-301). Follow the same directions as listed under Monday’s lesson. Notes can be taken in a notebook or on separate paper. Return to the Common Acids and Bases worksheet and fill in the “Strong or weak?” column.

Using Table 10.1 found on p. 300, complete the Acid-Base Reactions worksheet.

### **Friday, April 17**

Using a different color pen, grade your Acid-Base Reactions worksheet using the attached key.

Complete the Acid and Base Reactions Lab using the attached worksheet. As always, if you do not have a printer, you may recreate the worksheet on a separate sheet of paper.

Pages to be turned in from this week are underlined.



# Acids and Bases

How do acids and bases behave in water?

## Why?

Acids and bases play an important role in our lives. Numerous biological processes, industrial applications, and even environmental problems are a function of the acidity or basicity (alkalinity) of aqueous solutions. It is therefore important to understand what makes a substance behave as an acid or a base when dissolved in water. In this activity, we will explore the physical and chemical properties of acids and bases.

## Model 1 – Arrhenius Acids and Bases

Common Name for Aqueous Solution	Chemical Formula	Found in...	Tastes...	Turns Litmus Paper...	Conducts Electricity?	Acid or Base
Acetic acid	$\text{HC}_2\text{H}_3\text{O}_2(\text{aq})$	Vinegar	Sour	Red	Yes	Acid
Benzoic acid	$\text{HC}_7\text{H}_5\text{O}_2(\text{aq})$	Food preservative	Sour	Red	Yes	Acid
Phosphoric acid	$\text{H}_3\text{PO}_4(\text{aq})$	Soda pop	Sour	Red	Yes	Acid
Hydrochloric acid	$\text{HCl}(\text{aq})$	Stomach acid	Sour	Red	Yes	Acid
Citric acid	$\text{H}_3\text{C}_6\text{H}_5\text{O}_7(\text{aq})$	Citrus fruits	Sour	Red	Yes	Acid
Ascorbic acid	$\text{H}_2\text{C}_6\text{H}_6\text{O}_6(\text{aq})$	Vitamin C	Sour	Red	Yes	Acid
Magnesium hydroxide	$\text{Mg}(\text{OH})_2(\text{aq})$	Milk of magnesia	Bitter	Blue	Yes	Base
Aluminum hydroxide	$\text{Al}(\text{OH})_3(\text{aq})$	Antacids	Bitter	Blue	Yes	Base
Barium hydroxide	$\text{Ba}(\text{OH})_2(\text{aq})$	Lubricants	POISON	Blue	Yes	Base
Sodium hydroxide	$\text{NaOH}(\text{aq})$	Drain cleaner	POISON	Blue	Yes	Base

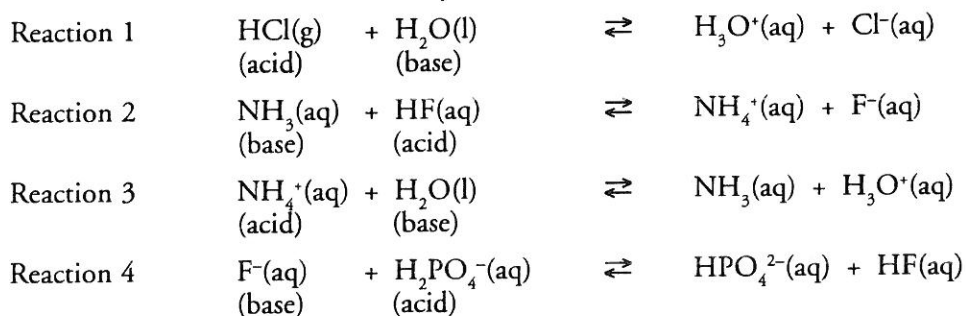
1. Refer to Model 1.
  - a. What is the common chemical name for Vitamin C?
  - b. Is Vitamin C classified as an acid or a base?
2. Examine the properties of the Arrhenius acids in Model 1. List three properties that all Arrhenius acids have in common.
3. Examine the chemical formulas for the Arrhenius acids in Model 1. What feature do all the Arrhenius acid chemical formulas have in common?
4. Examine the properties of the Arrhenius bases in Model 1. List two properties that all Arrhenius bases have in common.

- Examine the chemical formulas for the Arrhenius bases in Model 1. What anion do all the Arrhenius base chemical formulas have in common?
- A student dissolved a small amount of baking soda in water and tested it with litmus paper. The litmus paper turned blue. Is baking soda likely an acid or a base?

## Read This!

In 1903 Svante Arrhenius won the Nobel Prize in Chemistry for defining acids and bases in terms of the ions produced. An Arrhenius acid is any substance that produces hydrogen ions [or hydronium ions ( $\text{H}_3\text{O}^+$ ) a hydrogen ion attached to a water molecule] when dissolved in water. An Arrhenius base is any substance that produces hydroxide ions when dissolved in water. While the Arrhenius definitions of acids and bases are useful, they are limited. Johannes Brønsted and Thomas Lowry developed more general definitions for acids and bases using  $\text{H}^+$  ion (proton) transfer as the focus.

## Model 2 – Brønsted-Lowry Acids and Bases



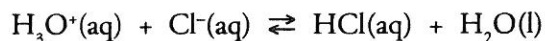
- Identify the Brønsted-Lowry acids in Model 2.
  - Atoms of which element are present in all of the Brønsted-Lowry acids in Model 2?
  - How can you tell from Reaction 1 that HCl loses an  $\text{H}^+$  ion rather than a hydrogen atom when the reaction occurs? *Hint:* Look at the products.
- For each acid–base reaction in Model 2, describe the role of the Brønsted-Lowry *acid* in the  $\text{H}^+$  ion (proton) transfer that occurs.
- For each acid–base reaction in Model 2, describe the role of the Brønsted-Lowry *base* in the proton ( $\text{H}^+$  ion) transfer that occurs.



10. As you saw in Model 1, all Arrhenius bases in Model 1 have an  $\text{OH}^-$  ion in their chemical formulas. Write a balanced chemical reaction for the reaction of  $\text{HCl}(\text{aq})$  with  $\text{OH}^-(\text{aq})$  to illustrate that the hydroxide ion is also a Brønsted-Lowry base.



11. If you reverse Reaction 1 in Model 2, the following reaction is obtained.



a. For the reaction above, which reactant is acting like a Brønsted-Lowry acid? How can you tell?

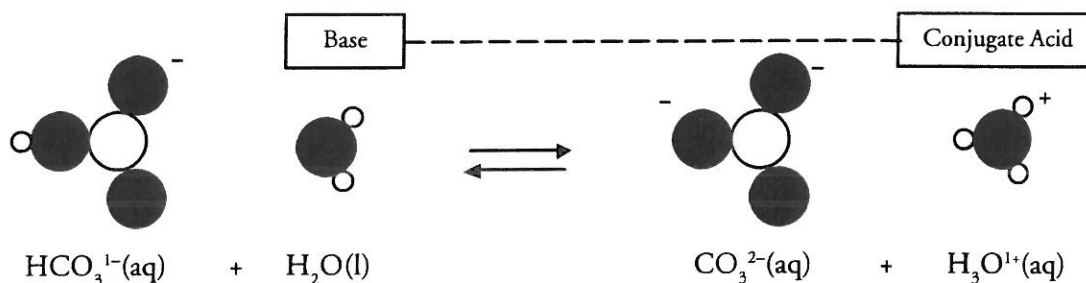
b. For the reaction above, which reactant is acting like a Brønsted-Lowry base? How can you tell?

12. Write the reverse reactions for Reactions 2 and 3 in Model 2. Label the Brønsted-Lowry acid and base reactants for each reaction.

Reaction 2

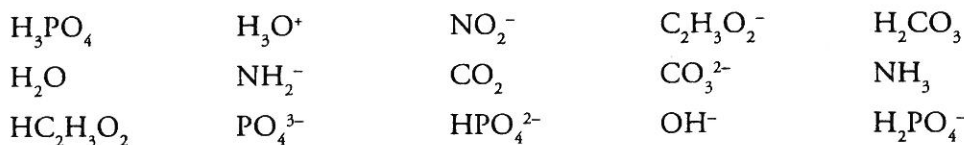
Reaction 3

### Model 3 – Conjugate Acid–Base Pairs



13. All acid–base reactions have two conjugate acid–base pairs. One conjugate acid–base pair in the reaction in Model 3 is  $\text{H}_3\text{O}^+/\text{H}_2\text{O}$ . List the other acid–base pair in the reaction.
14. Why is  $\text{HCO}_3^-$  considered the “acid” part of the pair in the reaction in Model 3?
15. Why is  $\text{CO}_3^{2-}$  considered the “base” part of the pair in the reaction in Model 3?
16. The “*Read This!*” box before Model 2 calls the transfer of a  $\text{H}^+$  ion a “proton transfer.” Explain why “ $\text{H}^+$  ion” and “proton” are synonymous.

17. Examine the charges on the species in the Model 3 reaction. Why does the charge on the carbon-containing ion change from  $-1$  to  $-2$ ?
18. Using the list of substances below, select pairs that are conjugate acids and bases. Enter the pairs in the tables below. The first acid–base pair has been entered for you. Note that you may use a substance more than once or not at all.



	Acid	Conjugate Base
1	$\text{H}_3\text{PO}_4$	$\text{H}_2\text{PO}_4^-$
2		
3		
4		

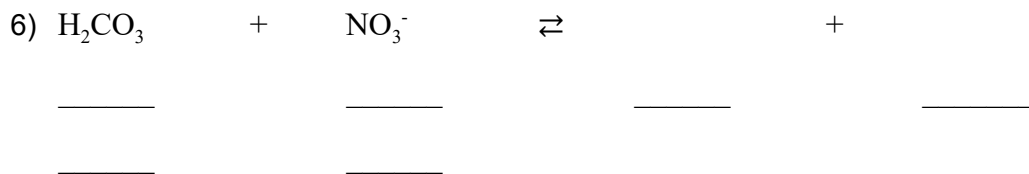
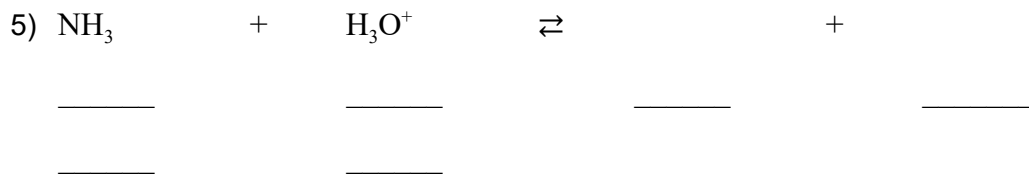
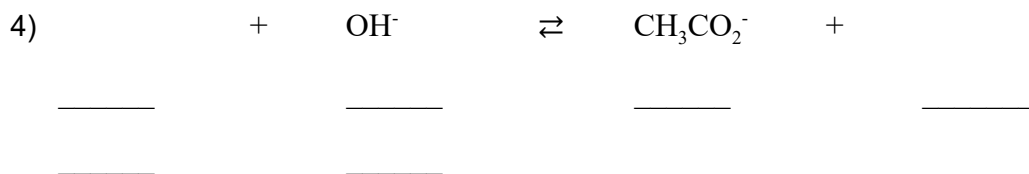
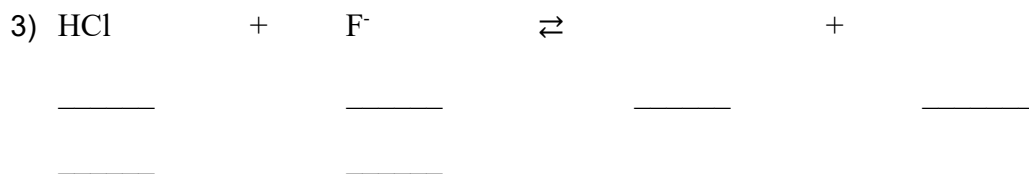
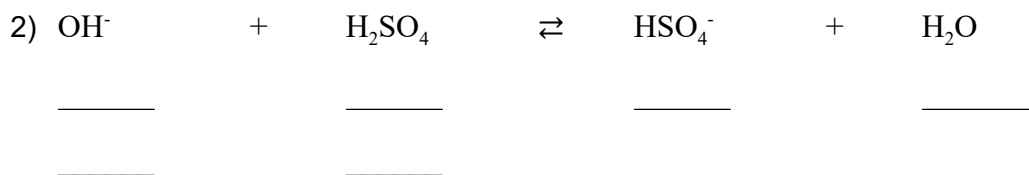
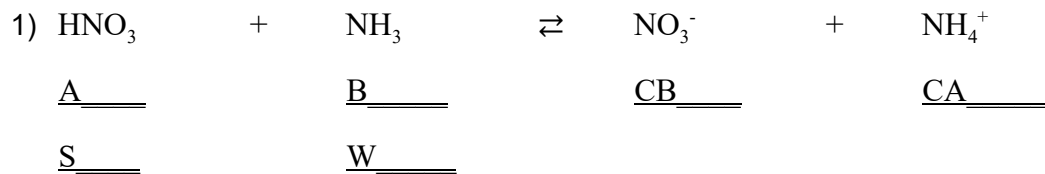
	Acid	Conjugate Base
5		
6		
7		



19. Write the formula for the conjugate base of each of the following acids. *Hint:* Be sure to consider charges.
- a.  $\text{HSO}_3^-$                       b.  $\text{HF}$                       c.  $\text{HS}^-$
20. Write the formula for the conjugate acid of each of the following bases. *Hint:* Be sure to consider charges.
- a.  $\text{SO}_3^{2-}$                       b.  $\text{F}^-$                       c.  $\text{HS}^-$
21. For the following reactions, label the acid and base in the reactants, and the conjugate acid and conjugate base in the products.
- $\text{HCO}_3^-(\text{aq}) + \text{NH}_3(\text{aq}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{CO}_3^{2-}(\text{aq})$
- $\text{HCO}_3^-(\text{aq}) + \text{HCl}(\text{aq}) \rightleftharpoons \text{Cl}^-(\text{aq}) + \text{H}_2\text{CO}_3(\text{aq})$
22. Is the role of a conjugate acid in the reverse direction the same as the role of an acid in the forward direction? Explain.

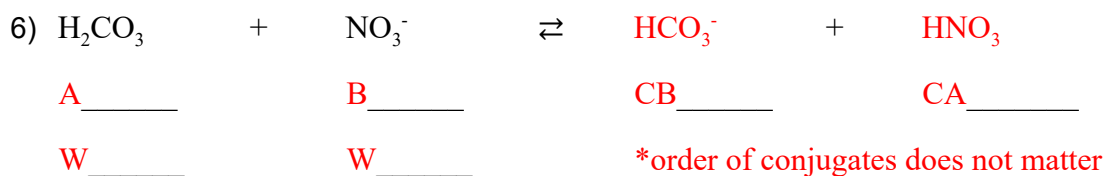
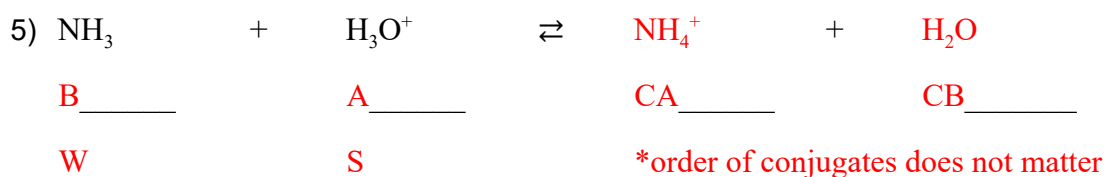
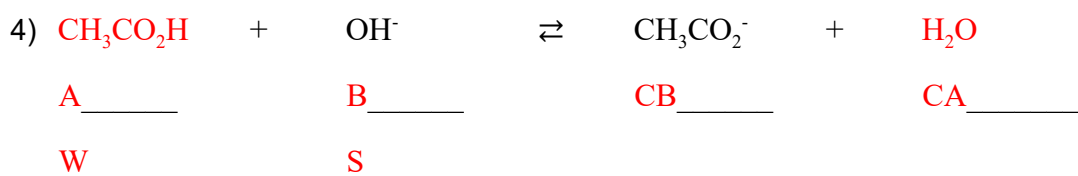
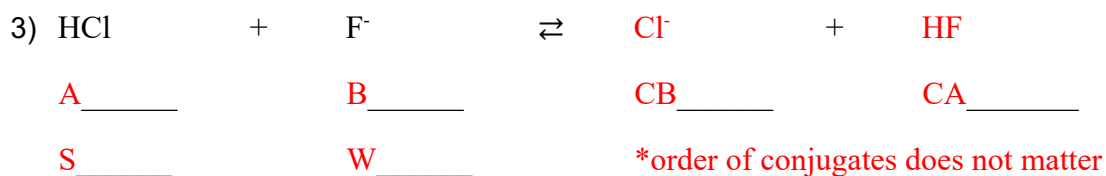
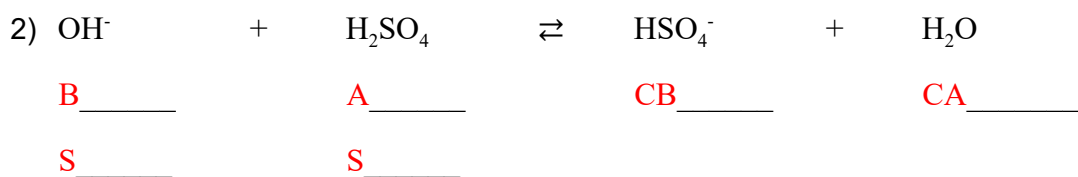
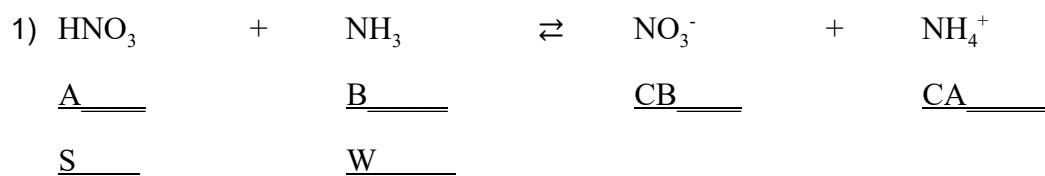
**Acid-Base Reactions**

**Directions:** Fill in the missing information for the following acid-base reactions. Label all acids (A), bases (B), conjugate acids (CA) and conjugate bases (CB). Indicate if the acid or base is strong (S) or weak (W). The first reaction is completed for you as an example.



Acid-Base Reactions **KEY**

**Directions:** Fill in the missing information for the following acid-base reactions. Label all acids (A), bases (B), conjugate acids (CA) and conjugate bases (CB). Indicate if the acid or base is strong (S) or weak (W). Finally, circle the proton that is transferred from the acid to the base. The first reaction is completed for you as an example.



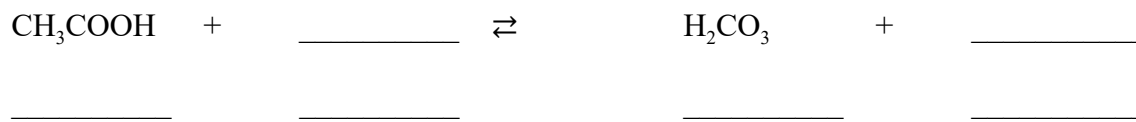
### Acid and Base Reactions Lab

**Directions:** Fill in the blanks in the chart.

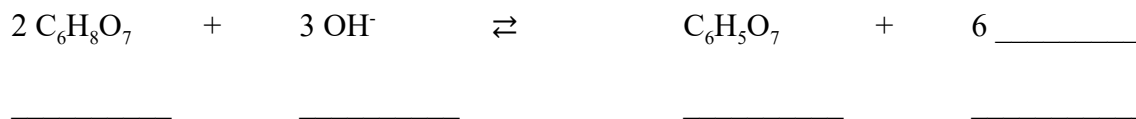
Common Name	Chemical Name	Formula	Structure	Acid or Base?
vinegar	acetic acid	CH <sub>3</sub> COOH		
lemon juice	citric acid			
baking soda	sodium bicarbonate			
antacid	magnesium hydroxide			
aspirin	acetylsalicylic acid			
bleach	sodium hypochlorite			

**Directions:** Complete the following reactions. Indicate whether the substance is an acid (A), base (B), conjugate acid (CA), or conjugate base (CB). The reactions have already been balanced. *Note that metal cations are not involved in an acid-base reaction so they are not included in the written chemical reaction.*

**Reaction 1: Vinegar and Baking Soda**



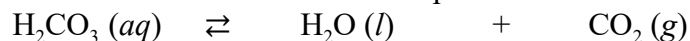
**Reaction 2: Lemon Juice and Antacid**



**Directions:** Gather vinegar and baking soda (if they are available in your home). Mix small amounts of each substance in a large container. Always ask permission to use materials from your home and encourage your family members to observe the reactions with you. Answer the following questions in complete sentences. If you do not have baking soda and vinegar, have a parent sign underneath question 1 and skip to question 2.

1. What did you observe upon mixing baking soda and vinegar?

Carbonic acid is an unstable molecule and decomposes into water and carbon dioxide.



2. Using this information, explain the presence of bubbles in the chemical reaction.

## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13-17, 2020**

**Course:** 10 Economics

**Teacher(s):** Mr. Loomis joseph.loomis@greatheartsirving.com

### Weekly Plan:

Monday, April 13

Answer questions on yesterday's reading. (From April 10th)

Tuesday, April 14

Read pp. 125 - 130b, following along with the supplemental notes.

Wednesday, April 15

Read pp. 131t - 135t "...completed almost instantaneously.", following along with the supplemental notes.

Thursday, April 16

Read pp. 138 "Renaissance..." - 146m "...average Dutch investor of 1800."

Follow along with the timeline and the map.

Friday, April 17

Read pp. 146m "Debt in England..." - 156m "...cash-poor former colonies."

Follow along with the timeline and the map.

Homework: review for a brief quiz on Monday.

### Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature

**Note:**

- This section, unlike the section on Marx, is more fact-based than conceptual (apart from the brief conceptual notes on the supply and demand of money). You are expected to know the definitions that I give you as well as the major dates. You do not need to know the map, although as general information it should be familiar to you. This will be included on the supplemental worksheets. You should expect to be quizzed on the concepts of what is capital, its factors of cost, risk and information, the important vocabulary and the timeline.
- As a note of reassurance: the amount of information and reading are going to feel overwhelming. This is normal. We will be doing a section on practical finance next week, so it will be very helpful to struggle with the concepts this week and to try your best to know them for the quiz. Do not try for a word-for-word understanding, but rather a general one. The quiz will be in the form of matching and fill in the blank questions.

**Monday, April 13th**

Briefly review your notes and give an explanation of the following concepts in your own words. Each explanation should be between 2 - 4 sentences.

- Man as a species-being, free and universal, pp.5m-6b
- The objectification of man's species-being, p.7t
- The estrangement of man's species-being, p.7m
- The emergence of private property, pp.7b-9m

**Tuesday, April 14th**

- See supplemental reading.

**Wednesday, April 15th**

- See supplemental reading.

**Thursday, April 16th**

- See supplemental reading.

**Friday, April 17th**

- See supplemental reading.



# Supplemental Readings

## Tuesday

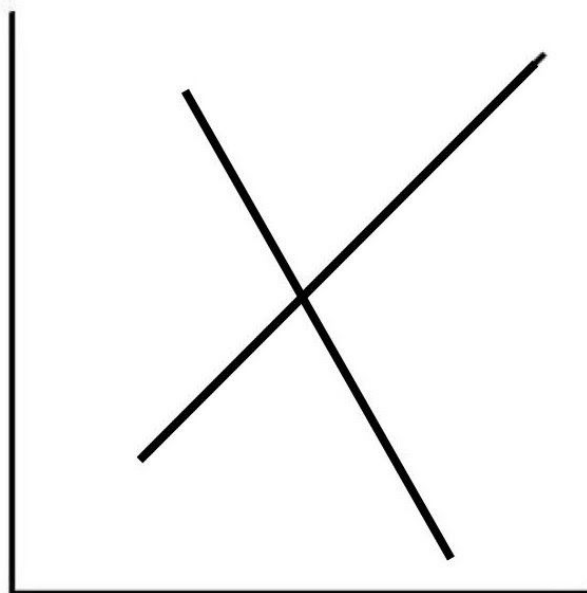
### Capital

#### Introduction

- Capital: wealth, usually in the form of money, owned by a person.
- As you are reading, ask yourselves how the factors of cost, risk and information (even if they are not clear to you already) appear in the story of Edison, Morgan and Villard.

#### The Cost of Capital

- The *cost* of money is *interest*. Interest is money paid regularly at a particular rate for the use of money lent. It is expressed as a percentage of the total amount that is not repaid.
- A loan: something given for a limited amount of time (here money) that is expected to be returned.
- *Cheap money* is when the interest rate is *low*. *Expensive money* is when it is *high*.
- The main factor that determines the size of the interest rate is the *supply and demand* of money. In this case the *suppliers* are the *lenders* and the *demanders* are the *borrowers*.
  - *Cheap money* (a low interest rate) results from there being many lenders and few borrowers: much supply and little demand.
  - *Expensive money* (high interest rates) results from there being many borrowers and few suppliers: little supply and much demand.
  - See if you can sketch this out using the supply and demand graph to see how price is influenced by shifts in supply and demand.



- The wealth of a nation tends to be proportional to how cheap money is (how low interest rates are) because the cheap availability of money stimulates business.
  
- Do not worry too much if you don't understand much on p.130. Just make sure you understand the following terms:
  - Bonds: a certificate issued by a government or a public company promising to repay borrowed money at a fixed rate of interest at a specified time.
  - Shares: one of the equal parts into which a company is divided, entitling the holder (investor) to a part of the profits.
  - Stock: the capital raised by a business through the sale of shares.

## Wednesday

### *The Risk of Capital*

- Another factor in the price of capital is *risk*. If a lender has a certain amount of extra money that he is willing to give out in exchange for interest, he is more likely to do so if the person can show that they are trustworthy than if they are not. The more trustworthy the person can prove themselves to be, the cheaper the money, and the lower its interest rate. Vice-versa for an untrustworthy person.
- Risk can be one of two things: *concentrated* or *diluted*. The example on p. 131 is helpful, but think of the difference as one between the following:
  - Concentrated risk: risk is greater the more it is concentrated, because there is more at stake for the fewer people involved. This, because they might take the entire loss if the investment fails. For example, if one or two people invest millions in a start-up, there is the risk that the start-up could fail and that they lose their entire investment.
  - Diluted risk: It is less risky the less concentrated (or the more diluted) it is. The more spread out an investment is (the more people share the risk) the less risky it is. Think of the previous situation, but instead of one or two persons, there might be 50+ people involved in the investment. How much risk would each person be taking in comparison?
  - As a result of these factors, lenders will decide what kind of an interest rate they will ask for the use of their money.
- We will go into bankruptcy laws and *Limited Liability Corporations* later. For now, I want you to understand that the general solution for reducing risk is to dilute the risk, or *syndication*. A syndicate is a group of individuals or organizations combined to promote some common interest. In this case, sharing an investment.

## Thursday

### *Timeline*

- XVIIIth BC: Mesopotamians make use of commodity loans with fixed interest rates. Interest rates are very high.
- Ancient Greece: development of certain forms of insurance, which is a form of profit-bearing risk game. Interest rates were very high.
- Ancient Rome: availability of low interest rates, but inconsistency based on an unsteady foundation: taxes, war, limited commercial activity.
- Italy:
  - XIIIth AD: Venice\* becomes a major financial center, financing wars through taking out interest bearing loans from wealthy citizens.
  - XVIth AD: appearance of the bill of exchange, a promissory note (an agreement between a creditor and a debtor involving interest) with the ability to be bought and sold. The *bill of exchange* is an early form of a security, a financial *item* that can be bought or sold. For example, a bill of exchange, a loan or a share.
- Holland/The Netherlands\*:
  - XVth-XVIth AD: the center of European finance moves from Italy to the Netherlands, first to Hanseatic cities (around Bremen and Hamburg)\*, then to Antwerp\* and finally to Amsterdam\*. The Dutch invent new types of *securities* and expand their use.
  - XVIIth - XVIIIth: the Dutch continue to invent new types of *securities*, expand the general access to capital and make Amsterdam the first financial capital of Europe.

# Friday

## *Timeline*

### England\*:

- 1688: *The Glorious Revolution* in England. The Catholic monarch James II is overthrown and replaced by the Dutch Protestant William of Orange. Dutch finance makes its way to England.
- XVIIIth: introduction of government debt in England, sold to the public with the promise of bearing interest, in order to solidify the national economy.
- XVIIth: introduction of the first joint-stock companies and *Limited Liability Corporations*, in England and in Holland.
  - Joint-Stock Company: a company owned and financed by share-holders.
  - Limited-Liability Corporation: a company where the share-holders are not financially responsible for the company.
- XIXth: the British government starts to repeal laws that discourage investments and JSCs. Eg. eliminating tariffs and debtor's prison. This incentivizes investment in England, and leads to that nation, and specifically London\*, becoming the financial capital of the world. This in turn leads it to become the world's economic and military leader.

# HISTORY OF FINANCE

~ XIII<sup>TH</sup> - XIX<sup>TH</sup>



## LEGEND

▨ HANSEATIC LEAGUE: XIII<sup>TH</sup> -

▩ NETHERLANDS: XIII<sup>TH</sup> - XVI<sup>TH</sup>

• CITIES

⊙ BATHEN

⊙ HAMBURG

## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13-17, 2020**

**Course:** 10 Humane Letters

**Teacher(s):** Mr. Garner ben.garner@greatheartsirving.org

### **Weekly Plan:**

Monday, April 13

Read *Crime and Punishment*, Part Three, chapter 2  
Answer chapter 2 reading questions

Tuesday, April 14

Read sections “The Haitian Revolution” and “Napoleon’s Empire” in *Western Heritage*  
Answer history reading questions

Wednesday, April 15

Read *Crime and Punishment*, Part Three, chapters 3-4  
Answer chapters 3-4 reading questions

Thursday, April 16

Read *Crime and Punishment*, Part Three, chapter 5  
Answer chapter 5 reading questions

Friday, April 17

Write reflections on *Crime and Punishment* passages

### **Statement of Academic Honesty**

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature









### ▼ The Haitian Revolution (1791–1804)

Between 1791 and 1804, the French colony of Haiti achieved independence. This event was of key importance for two reasons. First, it was sparked by policies of



Toussaint L'Ouverture (1746–1803) began the revolt that led to Haitian independence in 1804. Library of Congress

the French Revolution overflowing into its New World Empire. Second, the Haitian Revolution demonstrated that slaves of African origins could lead a revolt against white masters and mulatto freemen. The example of the Haitian Revolution for years thereafter terrified slaveholders throughout the Americas.

The relationship between slaves and masters on Haiti had been filled with violence throughout the eighteenth century. The French colonial masters had frequently used racial divisions between black slaves and mulatto freemen to their own political advantage. Once the French Revolution had broken out in France, the French National Assembly in 1791 decreed that free property-owning mulattos on Haiti should enjoy the same rights as white plantation owners. The Colonial Assembly in Haiti resisted the orders from France.

In 1791, a full-fledged slave rebellion shook Haiti. The coordination that preceded the rebellion required that slaves place a tremendous amount of faith in one another: any conversation that could have been interpreted as advocating rebellion would have led to death if reported or overheard. François-Dominique Toussaint L'Ouverture (1743?–1803), himself a former slave, quickly emerged as its leader. The rebellion involved enormous violence and loss of life on both sides. Although the slave rebellion collapsed, mulattos and free black people in Haiti, who hoped to gain the rights the French National Assembly had promised, then took up arms against the white colonial masters. French officials sent by the revolutionary government in Paris

 **View the Closer Look**  
“The Haitian Revolution: Guerrilla Warfare” on  
[MyHistoryLab.com](http://MyHistoryLab.com)


soon backed them. Slaves now came to the aid of an invading French force and, in early 1793, the French abolished slavery in Haiti. By this time both Spain and Great Britain were attempting to intervene in Haitian events to expand their own influence in the Caribbean. Both were opposed to the end of slavery and both coveted Haiti's rich sugar-producing lands. Toussaint L'Ouverture and his force of ex-slaves again supported the French against the Spanish and the British. By 1800, his army had achieved dominance throughout the island of Hispaniola. He imposed an authoritarian constitution on Haiti and made himself Governor-General for life, but he preserved formal ties with France.

The French government under Napoleon distrusted L'Ouverture and feared that his example would undermine French authority elsewhere in the Caribbean and North America. In 1802, Napoleon sent an army to Haiti and eventually captured L'Ouverture, who was sent back to France where he died in prison in 1803. Other Haitian military leaders of slave origin, the most important of whom was Jean-Jacques Dessalines (1758–1806), continued to resist. When Napoleon found himself again at war with Britain in 1803, he decided to abandon his American

empire, selling Louisiana to the United States and withdrawing his forces from Haiti. The Haitian revolution had an anticolonial aspect, but it was most important as the first successful slave rebellion in modern history. France formally recognized Haitian independence in 1804.

## ▼ Napoleon's Empire (1804–1814)

Between his coronation as emperor and his final defeat at Waterloo (1815), Napoleon conquered most of Europe. France's victories changed the map of the Continent. The wars put an end to the Old Regime and its feudal trappings throughout Western Europe and forced those European states that remained independent to reorganize themselves to resist Napoleon's armies.

 **View the Map** Map  
Discovery: Napoleon's  
Empire” on  
[MyHistoryLab.com](http://MyHistoryLab.com)

Everywhere, Napoleon's advance unleashed the powerful force of nationalism, discussed more fully in Chapter 20. His weapon was the militarily mobilized French nation, one of the achievements of the revolution. Napoleon could put 700,000 men under arms at one time, risk 100,000 troops in a single battle, endure heavy losses, and fight again. He could conscript citizen soldiers in unprecedented numbers, thanks to their loyalty to the nation and to him. No single enemy could match such resources. Even coalitions were unsuccessful, until Napoleon's own mistakes led to his defeat.

## Conquering an Empire

The Peace of Amiens (1802) between France and Great Britain was merely a truce. Napoleon's unlimited ambitions shattered any hope that it might last. He sent an army to restore the rebellious colony of Haiti to French rule. This move aroused British fears that he was planning a new French empire in America because Spain had restored Louisiana to France in 1801. More serious were his interventions in the Dutch Republic, the Italian peninsula, and Switzerland and his reorganization of the German states. The Treaty of Campo Formio had required a redistribution of territories along the Rhine River, and the petty princes of the region engaged in a scramble to enlarge their holdings. Among the results were the reduction of Austrian influence and the emergence of fewer, but larger, German states in the West, all dependent on Napoleon.

**British Naval Supremacy** Alarmed by these developments, the British issued an ultimatum. When Napoleon ignored it, Britain declared war in May 1803. William Pitt the Younger returned to office as prime minister in 1804 and began to construct the Third Coalition. By




By the time this painting was completed in 1807, Nelson was already a hero in Britain. Here he is depicted on his deathbed aboard his ship the *Victory*, during the British defeat of French and Spanish fleets at the Battle of Trafalgar in 1805. The lighting that illuminates Nelson's suffering face evokes religious paintings and suggests martyrdom. Arthur William Devis, "The Death of Nelson." Oil on canvas. The Granger Collection, NYC—All rights reserved

August 1805, he had persuaded Russia and Austria to move once more against France. A great naval victory soon raised the fortunes of the allies. On October 21, 1805, the British admiral Lord Nelson destroyed the combined French and Spanish fleets at the Battle of Trafalgar off the Spanish coast. Nelson died in the battle, but the British lost no ships. Although it would take ten more years before Napoleon's final defeat, Trafalgar ended all French hope of invading Britain and ensured that Britain would be able to maintain its opposition to France for the duration of the war. Britain had endeavored to establish supremacy on the high seas for centuries; now the navy dominated global commercial shipping and seemed undefeatable in military confrontation as well. The Battle of Trafalgar not only foreshadowed Napoleon's ultimate defeat by exposing French vulnerability to British strength, but also seemed the proof of a longstanding British belief that, in the words of one historian, "concentrating resources upon the navy would render Britain 'the guardian of liberty' throughout Europe."<sup>1</sup> Britain's dominance of the seas would not be seriously challenged until World War I.

**Napoleonic Victories in Central Europe** On land the story was different. Even before Trafalgar, Napoleon had marched to the Danube River to attack his continental enemies. In mid-October he forced an Austrian army to

surrender at Ulm and occupied Vienna. On December 2, 1805, in perhaps his greatest victory, Napoleon defeated the combined Austrian and Russian forces at Austerlitz. The Treaty of Pressburg that followed won major concessions from Austria. The Austrians withdrew from Italy and left Napoleon in control of everything north of Rome. He was recognized as king of Italy.

 **Read the Document**  
"Charles Parquin,  
"Napoleon's Army" " on  
[MyHistoryLab.com](http://MyHistoryLab.com)

Napoleon also made extensive political changes in the German states. In July 1806, he organized the Confederation of the Rhine, which included most of the western German princes. Their withdrawal from the Holy Roman Empire led the current Holy Roman Emperor, the Habsburg Francis II, to dissolve that ancient political body and henceforth to call himself Emperor Francis I of Austria.

Prussia, which had remained neutral up to this point, now foolishly went to war against France. Napoleon's forces quickly crushed the famous Prussian army at Jena and Auerstädt on October 14, 1806. Two weeks later, Napoleon was in Berlin. There, on November 21, he issued the Berlin Decrees, forbidding his allies from importing British goods. Napoleon, too, recognized the connection between Britain's commercial and military strength. On June 13, 1807, Napoleon defeated the Russians at Friedland and occupied East Prussia. Having occupied or co-opted the west German states, humbled and humiliated Austria, and defeated Prussia, the French emperor was master of all Germany.

<sup>1</sup>David Armitage, *The Ideological Origins of the British Empire* (Cambridge, UK: Cambridge University Press, 2000), p. 185.

In this 1806 caricature by the famous English artist James Gillray, Napoleon is shown as a baker who creates new kings as easily as gingerbread cookies. His new allies in the Rhine Confederation, including the rulers of Württemberg, Bavaria, and Saxony, are placed in the "New French Oven for Imperial Gingerbread." "Tiddy-Doll, the Great French Gingerbread Maker, Drawing Out a New Batch of Kings. His Man, Hopping Talley, Mixing Up the Dough," pub. by Hannah Humphrey, 23rd January 1806 (aquatint), Gillray, James (1757–1815). Leeds Museums and Galleries (City Art Gallery) U.K./The Bridgeman Art Library International



TIDDY-DOLL, the great French Gingerbread-Baker, drawing out a new Batch of Kings. — his Man Hopping Talley, mixing up the Dough.

**Treaty of Tilsit** Unable to fight another battle and unwilling to retreat into Russia, Tsar Alexander I (r. 1801–1825) was ready to make peace. He and Napoleon met on a raft in the Niemen River while the two armies and the nervous king of Prussia watched from the bank. On July 7, 1807, they signed the Treaty of Tilsit, which confirmed France's gains. Prussia lost half its territory. Only the support of Alexander saved it from extinction. Prussia openly and Russia secretly became allies of Napoleon.

Napoleon established his family as the collective sovereigns of Europe. The great French Empire was ruled directly by the head of the clan, Napoleon. On its borders lay satellite states ruled by members of his family. His stepson ruled Italy for him, and three of his brothers and his brother-in-law were made kings of other conquered states. The French emperor expected his relatives to take orders without question. When they failed to do so, he rebuked and even punished them. The imposition of Napoleonic rule provoked political opposition that needed only encouragement and assistance to flare up into serious resistance.

## The Continental System

After the Treaty of Tilsit, such assistance could come only from Britain, and Napoleon knew he must defeat the British before he could feel safe. Unable to compete with the British navy, he continued the economic warfare the Berlin Decrees had begun. He planned to cut off all British trade with the European continent and thus to cripple British commercial and financial power. He

hoped to cause domestic unrest and drive Britain from the war. The Milan Decree of 1807 went further and attempted to stop neutral nations from trading with Britain. (See Map 19–1.) Britain responded with its own set of decrees, the Orders of Council, which in turn forbid British subjects, allies, or even neutral countries from trading with France.

Despite initial drops in exports, domestic unrest, and tension between Britain and neutral countries that resented the ban, the British economy survived. British control of the seas assured access to the growing markets of North and South America and of the eastern Mediterranean. At the same time, the Continental System badly hurt the European economies. Napoleon rejected advice to turn his empire into a free-trade area. Such a policy would have been both popular and helpful. Instead, his tariff policies favored France, increased the resentment of foreign merchants, and made them less willing to enforce the system and more ready to engage in smuggling. It was, in part, to prevent smuggling that Napoleon invaded Spain in 1808. The resulting peninsular campaign in Spain and Portugal helped bring on his ruin.















## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13-17, 2020**

**Course:** 10 Latin IV

**Teacher(s):** Ms. Mueller [mariel.mueller@greatheartsirving.org](mailto:mariel.mueller@greatheartsirving.org)

**Supplemental Links:** [Aeneid I.64-80 Online Grammar Reference](#)  
[Aeneid Online Vocabulary Reference](#)

### Weekly Plan:

Monday, April 13

- Check last week's scansion assignment against the key provided and make corrections
- Read *Aeneid* Book I.76-80; identify subjects, verbs, and adjectives; check work; and make corrections
- Scan lines 76-80

Tuesday, April 14

- Check last week's translations against the key provided and make corrections
- Translate lines 76-80 into English

Wednesday, April 15

- Complete "*Aeneid* I.34-80 Grammar Questions" worksheet

Thursday, April 16

- Complete parts I and II of the "*Aeneid* I.34-80 Practice Test"

Friday, April 17

- Complete parts III and IV of the "*Aeneid* I.34-80 Practice Test"

### Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature

## Monday, April 13

1. Check last week's scansion assignments ("More Scansion Practice") against the key provided and make any necessary corrections.
2. Read *Aeneid* Book I.76-80 (pp. 16 of the textbook). This is your first encounter with this passage, and you are only reading for a basic understanding of the passage; do NOT translate these lines into English. Also, avoid the temptation to look up words in the dictionary the first time through. You may use the glossary provided on the same page for new words, but use context clues for all other words you don't know. Like last week, I encourage you to read the Latin aloud as this will help with your understanding.
3. On page 4 of the provided worksheets, for lines 76-80 (*Aeolus . . . potentem.*), circle all indicative, subjunctive, or imperative verbs; underline their subjects; and draw an arrow from any adjectives (including participles) to the word they modify. If using a sheet of notebook paper, identify these words by line (e.g. Line 34 - *siculae* modifies *telluris*, Line 35 - *laeti* is the subject of the verbs *dabant* and *ruebant*, etc.) and title the page "Aeneid, Book I.76-80 Translation." Please be sure to use a full header whether using notebook paper or the provided worksheets.
4. Check your work against the provided answer keys and make any necessary corrections in a different color pen.
5. Scan lines 76-80 either on the "Even More Scansion Practice" worksheet provided or on a piece of notebook paper. If using notebook paper, be sure to copy out the lines of Latin before scanning them and to title your paper "Even More Scansion Practice."

## Tuesday, April 14

1. Check last week's translations (*Aeneid* Book I. 55-75) against the key provided and make any necessary corrections. Keep in mind that there is more than one correct way to translate these lines into English (e.g. *spūmās salis* could translate "the foam of the sea" or "the sea's spray" or "the froth of the salt water" or "the salt water's foam," etc.).
2. Translate lines 76-80 into English either using the lines provided on the worksheets or on your notebook paper titled "Aeneid, Book I.76-80 Translation" from yesterday. If using the provided worksheets, try to line up your English translation with the Latin text as much as possible.
3. If you have any time remaining of the allotted 30 minutes, begin reviewing lines 34-54 by translating them aloud. Only refer to your translation when needed.

## Wednesday, April 15

Referring to your textbook and translation notes from the last two weeks, complete the "*Aeneid* I.34-80 Grammar Questions" worksheet. If a printed copy of the worksheet is not available to you, you may write out the answers on a separate piece of notebook paper. Please be sure to use a full heading and include the title "*Aeneid* I.34-80 Grammar Questions."

**Thursday, April 16**

Referring to your textbook and translation notes from the last two weeks, complete parts I and II of the “*Aeneid* I.34-80 Practice Test.” If a printed copy of the practice test is not available to you, you may write out the answers on a separate piece of notebook paper. Please be sure to use a full heading and include the title “*Aeneid* I.34-80 Practice Test.”

**Friday, April 17**

Referring to your textbook and translation notes from the last two weeks, complete parts III and IV of the “*Aeneid* I.34-80 Practice Test.” If a printed copy of the practice test is not available to you, you may write out the answers on the notebook paper titled “*Aeneid* I.34-80 Practice Test.”

## Answer Keys

### Monday, April 13th

See separate "More Scansion Practice" answer key for last week's scansion assignment.

Aeneid Book 1. 76-80 subject, verb, and adjective identifications

Line 76 - *Aeolus* is the subject of an understood (*dixit*), *Tuus* modifies *labor* in line 77, *optes* is a subjunctive verb in the second person whose subject is "you" referring to Juno.

Line 77 - *explorare* is the infinitive subject of an understood (*est*) that can be translated impersonally (i.e. "it is your task to . . ."), *capessere* is the infinitive subject of the verb *est* which can also be translated impersonally (i.e. "it is right for me to . . .")

Line 78 - Both *Tu* and *tu* are subjects of the verb *concilias* in line 79

Line 79 - see the note on *concilias* in line 78 above, *tu* is the subject of the verb *das* and the verb *facis* in line 80.

Line 80 - see the note on *facis* in line 79 above

See also "Answer Key Supplement 5"

### Tuesday, April 14th

Aeneid Book 1.55-75 Translation

(Lines 55-59) They (i.e. the winds) being angry roar around the barrier with a great murmur of the mountain; Aeolus sits in his lofty citadel holding his scepter and he soothes their spirits and calms their anger. If he were not doing this, the swift (winds) would carry off with themselves the seas and the lands and the vast sky and would sweep them through the air; (Lines 60-63) but fearing this, the all powerful father hid them in dark caverns and he placed upon (them) a structure and high mountains besides, and he gave (them) a king who in a fixed agreement would know both to restrain (them) and having been ordered to give (them) loose reins. (Lines 64-68) To him (i.e. Aeolus) then humble Juno employed these words: "Aeolus, (indeed the father of the gods and the king of men has granted to you (the power) both to calm the waves and to raise (them) with the wind), a race hostile to me sails the Tyrrhenian Sea bringing Ilium (i.e. Troy) and (their) conquered household gods into Italy: (Lines 69-70) strike power into the winds and crush their sunken ships, or drive them (i.e. the Trojans) scattered/in different directions and disperse their bodies on the sea. (Lines 71-75) I have (*literally* there are to me) twice seven (i.e. 14) Nymphs with excellent form (i.e. beauty), of whom is Deiopea who is the most beautiful in shape, I will join (you) in lasting marriage and I will call (her) your own, so that she may live all her years with you for such merits and may make you a parent with beautiful offspring."



Scan the following lines (Aeneid I.55-59) written in Dactylic Hexameter. If needed, refer to the “Part Three: Metrics” pages from last week’s packet.

55    Īll(ī) in | dignan | tēs mag | nō cum | murmurē | montis  
 \* circum | claustrā fre | munt; cel | sā sedet | Aeolus | arce  
 scēptrā te | nēns, mol | litqu(e) ani | mōs et | temperat | irās.  
 nī faci | at, mari | (a) ac ter | rās cae | lumque pro | fundum  
 quippe fe | rant rapi | dī sē | cum ver | rantque per | aurās;

\* The second syllable in the second foot of this line was doubtful (could be either long or short). Remember that the preceding vowel is doubtful if *l* or *r* is the second consonant in a consonantal blend

Scan the following lines (Aeneid I.65-70) written in Dactylic Hexameter. If needed, refer to the “Part Three: Metrics” pages from last week’s packet.

65    “Aeole, | namque ti | bī dī | vum pater | atqu(e) homi | num rēx  
 et mul | cēre de | dit flūc | tūs et | tollere | ventō,  
 gēns ini | mīca mi | hī Tyr | rhēnum | nāvīgat | aequor,  
 Īli(um) in | Ītali | am por | tāns vic | tōsque pe | nātēs:  
 incute | vim ven | tīs sub | mersās | qu(e) obrue | puppēs,  
 70    aut age | dīver | sōs et | dissice | corpora | pontō.

- 61 Hoc metuēns mōlemque et montēs īnsuper altōs \_\_\_\_\_  
imposuit rēgemque dedit quī foedere certō \_\_\_\_\_  
et premere et laxās scīret dare iussus habēnās. \_\_\_\_\_  
Ad quem tum Jūnō supplex hīs vōcibus ūsa est: \_\_\_\_\_
- 65 “Aeole, namque tibī dīvum pater atque hominum rēx \_\_\_\_\_  
et mulcēre dedit flūctūs et tollere ventō, \_\_\_\_\_  
gēns inimīca mihi Tyrrhēnum nāvīgat aequor \_\_\_\_\_  
Īlium in Ītaliā portāns victōsque Penātēs: \_\_\_\_\_  
incute vim ventīs summersāsque obrue puppēs, \_\_\_\_\_
- 70 aut age dīversōs et dissiice corpora pontō. \_\_\_\_\_  
Sunt mihi bis septem praestantī corpore nymphae, \_\_\_\_\_  
quārum quae formā pulcherrima, Dēiopēa, \_\_\_\_\_  
cōnūbiō iungam stabilī propriamque dicābō, \_\_\_\_\_  
omnēs ut tēcum meritīs prō tālibus annōs \_\_\_\_\_
- 75 exīgat et pulchrā faciat tē prōle parentem.” \_\_\_\_\_  
Aeolus haec contrā: “Tuus, Ō rēgīna, quid optēs \_\_\_\_\_  
explōrāre labor; mihi iussa capessere fās est. \_\_\_\_\_  
Tū mihi quodcumque hoc rēgnī, tū scēptra Iovemque \_\_\_\_\_  
conciliās, tū dās epulīs accumbere dīvum \_\_\_\_\_
- 80 nimbōrumque facis tempestātumque potentem.” \_\_\_\_\_

Answer Key Supplement 5

Aeneid I.61-80

Juno and Aeolus as patron and client

4

61 Hoc metuēns mōlemque et montēs īnsuper altōs \_\_\_\_\_

imposuit rēgemque dedit quī foedere certō \_\_\_\_\_

et premere et laxās scīret dare iussus habēnās. \_\_\_\_\_

Ad quem tum Jūnō supplex hīs vōcibus ūsa est: \_\_\_\_\_

65 “Aeole, namque tibī dīvum pater atque hominum rēx \_\_\_\_\_

et mulcēre dedit flūctūs et tollere ventō, \_\_\_\_\_

gēns inimīca mihi Tyrrhēnum nāvīgat aequor \_\_\_\_\_

Īlium in Ītaliā portāns victōsque Penātēs: \_\_\_\_\_

incute vim ventīs summersāsque obrue puppēs, \_\_\_\_\_

70 aut age dīversōs et dissiice corpora pontō. \_\_\_\_\_

Sunt mihi bis septem praestantī corpore nymphae, \_\_\_\_\_

quārum quae formā pulcherrima, Dēiopēa, \_\_\_\_\_

cōnūbiō iungam stabilī propriamque dicābō, \_\_\_\_\_

omnēs ut tēcum meritīs prō tālibus annōs \_\_\_\_\_

75 exigat et pulchrā faciat tē prōle parentem.” \_\_\_\_\_

Aeolus haec contrā: “Tuus, Ō rēgīna, quid optēs \_\_\_\_\_

explōrāre labor; mihi iussa capessere fās est. \_\_\_\_\_

Tū mihi quodcumque hoc rēgnī, tū scēpra Iovemque \_\_\_\_\_

conciāās, tū dās epulīs accumbere dīvum \_\_\_\_\_

80 nimbōrumque facis tempestātumque potentem.” \_\_\_\_\_

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## Even More Scansion Practice

*Scan the following lines (Aeneid I.76-80) written in Dactylic Hexameter. If needed, refer to the "Part Three: Metrics" pages from the 1<sup>st</sup> week's packet.*

Aeolus haec contrā: "Tuus, Ō rēgīna, quid optēs  
65 explōrāre labor; mihi iussa capessere fās est.  
Tū mihi, quodcumque hoc rēgnī, tū scēptra Iovemque  
conciliās, tū dās epulīs accumbere dīvum,  
nimbōrumque facis tempestātumque potentem."

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Aeneid I.34-80 Grammar Questions**

I. From lines 34-64, find, copy out, and provide line references for the following. The first one is done for you:

1. a second declension genitive plural in *-um*: Argivum (line 40); divum (line 46)
2. an ablative of separation: \_\_\_\_\_
3. an appositive: \_\_\_\_\_
4. three verbs in the subjunctive: \_\_\_\_\_
5. three participles NOT in the nominative: \_\_\_\_\_
6. the objects of these participles:  
*servans* (line 36) \_\_\_\_\_  
*exspirantem* (line 44) \_\_\_\_\_  
*volutans* (line 50) \_\_\_\_\_  
*tenens* (line 57) \_\_\_\_\_  
*metuens* (line 61) \_\_\_\_\_

II. From lines 65-80, find, copy out, and provide line references for:

7. two verbs in the future tense: \_\_\_\_\_
8. a dative of possession: \_\_\_\_\_
9. a second declension genitive plural in *-um*: \_\_\_\_\_
10. two vocatives: \_\_\_\_\_
11. four imperatives: \_\_\_\_\_
12. a superlative adjective: \_\_\_\_\_

I. Circle the letter that best answers the questions based on the passage below:

55 illī indignantēs magnō cum murmure montis  
circum claustra fremunt; celsā sedet Aeolus arce  
scēpra tenēns, mollitque animōs et temperat Irās.  
nī faciat, maria ac terrās caelumque profundum  
quippe ferant rapidī sēcum verrantque per aurās.  
60 sed pater omnipotēns spēluncīs abdidit ātrīs,  
hoc metuēns, mōlemque et montēs īnsuper altōs  
imposuit, rēgemque dedit, quī foedere certō  
et premere et laxās scīret dare iussus habēnās.  
ad quem tum Iūnō supplex hīs vōcibus ūsa est:  
65 “Aeole, namque tibī dīvum pater atque hominum rēx  
et mulcēre dedit flūctūs et tollere ventō,  
gēns inimīca mihī Tyrrhēnum nāvīgat aequor,  
Īlium in Ītaliā portāns victōsque Penātēs:  
incute vim ventīs submersāsque obrue puppēs,  
70 aut age dīversōs et disice corpora pontō.  
sunt mihi bis septem praestantī corpore nymphae,  
quārum quae fōrmā pulcherrima Dēiopēa,  
cōnūbiō iungam stabilī propriamque dicābō,  
omnēs ut tēcum meritīs prō tālibus annōs  
75 exigat et pulchrā faciat tē prōle parentem.”

1. In line 59, *-que* connects
  - a. *secum* and *verrant* (line 59)
  - b. *verrant* and *per* (line 59)
  - c. *ferant* and *verrant* (line 59)
  - d. *secum* and *auras* (line 59)
2. In line 59, *secum* is translated
  - a. to himself
  - b. to herself
  - c. with him
  - d. with them
3. The antecedent of *qui* (line 62) is
  - a. *regem* (line 62)
  - b. *foedere* (line 62)
  - c. *montes* (line 61)
  - d. *iussus* (line 63)
4. The phrase *divum . . . rex* (line 65) refers to
  - a. Ajax
  - b. Aeneas
  - c. Priamus
  - d. Jupiter

5. The case and number of *fluctus* (line 66) is
  - a. nominative singular
  - b. nominative plural
  - c. accusative plural
  - d. genitive singular
6. In line 67, the phrase *gens inimical mihi* describes
  - a. Trojans
  - b. Nymphae
  - c. Greeks
  - d. Danai
7. From line 68, we learn that
  - a. Penates is bringing Ilium into Italy
  - b. Ilium conquered the Penates as they Were being carried to Italy
  - c. the remnants of the Trojan state and its religion are being brought to Italy
  - d. the defeated Trojans are carrying the Penates into Ilium
8. In line 70, *dissice* is
  - a. present infinitive
  - b. present imperative
  - c. accusative singular
  - d. ablative singular
9. Why is Deiopea an especially valuable bribe?
  - a. she is the most beautiful
  - b. she is fourteen years old
  - c. she has beautiful offspring
  - d. she has performed many duties for Juno
10. The form *iungam* (line 73) is a(n)
  - a. perfect participle
  - b. accusative singular
  - c. present subjunctive
  - d. future indicative

*II. Translate the following passage into English:*

ipsa Iovis rapidum iaculāta ē nūbibus ignem  
 disiēcitque ratēs ēvertitque aequora ventīs,  
 illum expīrantem trānsfixō pectore flammās  
 turbīne corripuit scopulōque infixit acūtō;  
 5 ast ego, quae dīvum incēdō rēgīna Iovisque  
 et soror et coniunx, ūnā cum gente tot annōs  
 bella gerō.

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III. Scan the following lines:

sed pater omnipotēns spēluncīs abdidit ātrīs,  
hoc metuēns, mōlemque et montēs īnsuper altōs  
imposuit, rēgemque dedit, quī foedere certō  
et premere et laxās scīret dare iussus habēnās.

IV. Paragraph Response:

65 “Aeole, namque tibi dīvum pater atque hominum rēx  
et mulcēre dedit flūctūs et tollere ventō,  
gēns inimīca mihi Tyrrhēnum nāvigat aequor,  
Ilium in Ītaliā portāns victōsque Penātēs:  
incute vim ventīs submersāsque obrue puppēs,  
70 aut age dīversōs et disice corpora pontō.  
sunt mihi bis septem praestantī corpore nymphae,  
quārum quae fōrmā pulcherrima Dēiopēa,  
cōnūbiō iungam stabilī propriamque dicābō,  
omnēs ut tēcum meritīs prō tālibus annōs  
75 exigat et pulchrā faciat tē prōle parentem.”

In the passage above, we see Juno make a rhetorical appeal to Aeolus to solicit his help. In a well-developed paragraph **discuss the elements of Juno’s appeal to Aeolus and what these elements reveal about how she perceives Aeolus.** Be sure to begin your paragraph with a clear topic sentence/thesis statement and refer specifically to the Latin throughout the passage to support the points you make in your essay.

(When you are asked to refer specifically to the Latin, you must write out the Latin and/or cite line numbers AND you must translate, accurately paraphrase, or make clear in your discussion that you understand the Latin.)

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## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13 - 17, 2020**

**Course:** 10 Precalculus

**Teacher(s):** Mr. Simmons

### Weekly Plan:

Monday, April 13

Problem set 4.7: 6-12

Tuesday, April 14

Problem set 4.7: 6-12 answer key

"Introduction to Angles" handout

Wednesday, April 15

Start "Radians" handout

Thursday, April 16

Continue "Radians" handout

Friday, April 17

Finish "Radians" handout

### Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature

## Monday, April 13

1. Complete problem set 4.7: 6-12.

## Tuesday, April 14

1. Check your answers to problem set 4.7: 6-12.
2. Read this, here:

This concludes our discussion of exponential and logarithmic functions. We have already taken a test covering sections 4.1-4.5, and since then we have covered 4.6 and 4.7. We will be omitting section 4.8, since it deals not primarily with mathematics, but with the practical application of mathematics. A test over sections 4.6 and 4.7 is forthcoming, but due to the difficulties of testing remotely, the date of this test cannot yet be determined. So, we will move on to the next topic. When a date for the test can be set, we will then spend time in review preparing for the test, but for right now, let's put exponential and logarithmic functions to the side, and move on to another topic that will prepare us well for calculus.

Math is the study of quantity, of number and shape, and one of the fundamental aspects of shape is angle. We've all seen angles before, and we'd probably all say that we know what an angle is. But there is a difference between seeing and looking, between knowing what something is intuitively and analyzing it rigorously. Here begins our rigorous analysis of angle. The simplest shape that can be constructed from angles is a triangle, and hence the branch of mathematics into which we are about to delve is known as **trigonometry** (from Modern Latin *trigonometria*, from Greek *trigonon* "triangle" (from *tri-* "three" + *gōnia* "angle, corner" + *metron* "a measure").

Notice, we are moving on from one topic and starting another. This is a major shift. I am very sorry that we can't all be in the same room as we should be. This should be a grand transition: having routed exponential functions, we charge on to conquer the branch of mathematics perhaps most feared above all, the much-slandered *trig*. It is sad that I can't be there to encourage you in person, to quell whatever fears you might have at what may appear to be a daunting task, but we make do with what we have. Trigonometry is mathematics, and mathematics is an adventure. You are here to challenge your mind and explore the possibilities of logical deduction, to discover the beauty of these eternal truths. This will be more difficult than it should, given the isolation from each other that we are all experiencing, but again, take courage and persevere. I am available through email if you would like to reach out, and I would be happy to hear from you.

3. Read through the handout entitled "Introduction to Angles," following all instructions therein. This is mathematical writing. Mathematical reading is slow going. Read slowly. Don't move on from a sentence until you've understood what it says. If you read at a normal pace, or even a slow but steady pace of reading aloud, you're probably moving too fast. Pause after every sentence to

make sure you understand what it has said. Draw diagrams if it's helpful, even if you're not instructed to. Enjoy!

### **Wednesday, April 15**

1. If you have not finished reading it, finish reading yesterday's handout ("Introduction to Angles").
2. Similarly to yesterday, today you will be reading about angles. Find the handout entitled "Radians," and start reading through it, completing all instructions therein. (You will have this week to complete it, so don't worry if you don't finish by the end of 40 minutes.) Pause when it tells you to pause. Force yourself honestly to answer the questions it asks to the best of your ability without moving on until you've done so. Again, read slowly. Sloooooowly. Pause after every sentence to make sure you've understood what it says. This is math. Mathematical reading is slow going. Read. Slowly.

### **Thursday, April 16**

1. Continue completing the handout entitled "Radians." If you have finished, review it. Make sure you've learned all vocabulary from both handouts.

### **Friday, April 17**

1. Continue completing the handout entitled "Radians." If you have finished, review it. Make sure you've learned all vocabulary from both handouts.

# Introduction to Angles

*Precalculus*

*Mr. Simmons*

This handout is simply a primer on the terminology surrounding angles, so that we're all on the same page when we talk about them. Please review the following definitions and then answer the questions at the end. I hope the vocabulary here isn't too daunting.

As a preface, consider this: a good way to think about angles is in terms of rotational motion (similarly to how we talk about a ray as “emanating” or “extending” from a single point, even though it is really a fixed object that doesn't move). Imagine you're standing on the  $xy$ -plane in the fourth quadrant (bottom-right), and you want to walk into the first quadrant (upper-right), and there's a door in the way, with its hinge at the origin and its knob at  $(1, 0)$ . You open the door a little too fast, so the knob slams into  $(0, 1)$ , putting a hole through the  $y$ -axis. There, you've got a right angle. This image helps us phrase the measurement of angles in terms of rotation. Rotation “begins” when the knob is at  $(1, 0)$  and “ends” when the knob is at  $(0, 1)$ . There's nothing actually dynamic (motion-related) about angles—since they are, like everything else in mathematics, abstract objects, eternally constant and immutable—but it's helpful to think of them as dynamic so that we finite, mutable, inconstant humans can describe and understand them more easily.

Learn these definition. You don't have to memorize them verbatim, but if asked, you should be able to provide, off the top of your head, a mathematically correct definition.

**Definition** (RAY). A ray is a set containing one point on a line and all points extending in one direction from that point.

**Definition** (ANGLE). An angle is the union of two rays having a common endpoint.

**Definition** (VERTEX). A vertex is the common endpoint of two rays that form an angle.

**Definition** (INITIAL SIDE). The initial side of an angle is the side of that angle from which rotation begins.

**Definition** (TERMINAL SIDE). The terminal side of an angle is the side of that angle at which rotation ends.

**Definition** (MEASURE OF AN ANGLE). The measure of an angle is the amount of rotation from the initial side to the terminal side. Conventionally, we use Greek letters as variables for the measure of an angle, typically theta ( $\theta$  or  $\vartheta$ ), phi ( $\phi$  or  $\varphi$ ), alpha ( $\alpha$ ), beta ( $\beta$ ), or gamma ( $\gamma$ ).

**Definition** (DEGREE). The degree ( $^\circ$ ) is a unit of measure describing the size of an angle of one degree ( $1^\circ$ ) as one 360th of a full revolution of a circle.

**Definition** (STANDARD POSITION). Standard position is the position of an angle having its vertex at the origin and its initial side along the positive  $x$ -axis.

**Definition** (POSITIVE ANGLE). A positive angle is an angle measured counterclockwise from the positive  $x$ -axis.

**Definition** (NEGATIVE ANGLE). A negative angle is an angle measured clockwise from the positive  $x$ -axis.

**Definition** (QUADRANTAL ANGLE). A quadrantal angle is an angle whose terminal side lies on an axis (e.g., an angle of  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ , or  $270^\circ$ ).

**Definition** (CENTRAL ANGLE). A central angle of a circle is an angle whose vertex is the circle's center.

*Complete the following exercises on a separate sheet of paper.*

**Exercise 1.** Sketch an angle of  $30^\circ$  in standard position.

**Exercise 2.** Sketch an angle of  $-135^\circ$  in standard position.

**Exercise 3.** Sketch the angle of  $240^\circ$  in standard position as a central angle of the unit circle.

# Radians

*Precalculus*

*Mr. Simmons*

*Read through this handout carefully and pause to think and respond when instructed.*

We got the unit called degrees ( $^\circ$ ) by dividing a full rotation into 360 equally sized angles and saying that each of those angles had measure  $1^\circ$ . Note that the number 360 was an arbitrary choice: we could have chosen 4, or 10, or any other counting number. But 360 is useful, because it is divisible by so many numbers (i.e., by 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 40, 45, 60, 72, 90, 120, 180, and 360 itself). Fun fact: 360 is therefore called a “highly composite” number. So are 12 and 60, which is why there are 12 inches in a foot and 60 minutes in an hour (and 60 seconds in a minute).<sup>1</sup>

But is there a less arbitrary way to measure an angle? When we look at an angle and wonder how big it is, we generally wonder, in an intuitive sense, how “far apart” the two rays are. A bigger angle will mean two rays that are “further apart.” But, of course, the distance between the two rays is ... zero. Always. Because they’re touching (at the vertex).

So what do we do? Last handout, we pictured the standard position right angle as the swinging open of a door whose hinge is at the origin and whose knob swings from  $(1, 0)$  to  $(0, 1)$ . This dynamic representation of an angle allows us to measure the angle not by asking how “far apart” the rays are (because that number will always be zero), but by asking how far the knob has swung. So let’s trace the path of the knob.

In the space below (or, if you haven’t been able to print out this document, then on a separate sheet of paper), sketch the aforementioned standard position right angle, the one represented by the door swinging open, with its vertex at the origin and rays that pass through the points  $(1, 0)$  and  $(0, 1)$ :

Now put your pencil down at  $(1, 0)$  and start drawing the unit circle counterclockwise, but stop once you get to  $(0, 1)$ . If we think of this angle as representing the opening of the door, then what you just traced is the path of motion of the doorknob.

---

<sup>1</sup> Just for fun, consider the pros and cons of the metric system of units versus the imperial system of units. Sure, the metric system simplifies everything to base 10, but there are good reasons to use highly composite numbers like 8, 12, and 36.

What you just drew is called an **arc**. An arc may be a portion of a full circle, a full circle, or even more than a full circle. The length of the arc around an entire circle is called the **circumference** of that circle. The arc you just drew is just a portion of the unit circle (one fourth, to be specific), and it has two **endpoints**:  $(1, 0)$  and  $(0, 1)$ .

We say that the arc you just drew **subtends** our right angle, because the angle's rays go through the arc's endpoints, and the angle's vertex is the arc's circle's center (in this case, the origin). We said earlier that measuring the path of the knob, that is, measuring this arc, would help us measure the angle. Well, this arc has length one quarter the circumference of the unit circle. Take a moment to find out exactly what that is. Write your answer here (or on a separate sheet of paper):

There, we have a number! Can we say now that that's the measure of our angle? Why or why not? Write down your thoughts:



---

If we look at any given angle, intuitively we want to measure it, as we've said, by the length of the arc that subtends it. But the problem is, it is subtended by many arcs. An infinite number of arcs. Take, for instance, the right angle we were just considering. Depending on which circle you choose to draw over it (centered at the origin, of course), you could make it subtended by an arc of any length you like by simply making the circle bigger or smaller. So how can we use arc lengths to measure angles?

One way to do it is simply, as we just did, to choose the unit circle every time. Given any angle, look at the arc on the unit circle that subtends that angle, and call that arc length the measure of the angle. A right angle is subtended by an arc of length—you calculated it earlier— $\frac{\pi}{2}$ .<sup>2</sup> So we say that a right angle has measure  $\frac{\pi}{2}$ . Beautiful!

But picking the unit circle still feels a bit arbitrary. What's so special about the unit circle? Instead of picking a particular circle, shouldn't we pick an arbitrary circle? Angles aren't doors, they're connected rays. Unlike doors, rays are infinitely long, and there's nothing special about one point on the ray versus another (other than the vertex, but we already said we can't use that one). Is there any way that, given an angle we're trying to measure, we can come up with a measure, a number, based on arc length, without it mattering which arc we pick? Sounds crazy. Stop and think about it. Write your thoughts here (or, as before, if appropriate, on a separate sheet of paper):

---

<sup>2</sup> This is because the unit circle has circumference  $2\pi r = 2\pi(1) = 2\pi$ , one fourth of which is  $\frac{\pi}{2}$ .

Consider that, for any given angle you're trying to measure, as you choose bigger and bigger arcs, the circles that they are portions of will also be bigger and bigger. And what does it mean for a circle to be bigger? Before moving on, take a moment to recall the precise definition of a circle.

...  
A circle is the set of all points equidistant from a center point, and we call that distance the circle's radius. So a circle is defined in terms of its radius. What it *means* for a circle to be "bigger" is that its radius is longer. So the bigger the arc you choose, the bigger the radius that goes along with it. If we choose a circle of radius 2, then instead of getting an arc of length  $\frac{\pi}{2}$ , we get an arc of length ... well, what's a quarter of this new circle's circumference? Write it down:

That's right, the new arc length is  $\pi$ . That's different from  $\frac{\pi}{2}$ . Sounds like a problem. But wait, if we got an arc of length  $\frac{\pi}{2}$  when we had a circle of radius 1, and we got an arc of length  $\pi$  when we had a circle of radius 2 ... Do we see a pattern? What's the pattern? Write down your thoughts:

Just as every integer, even if we don't write it as a ratio, is a ratio with a denominator of 1, so is every angle measure a ratio. When we pick the unit circle, we are choosing a denominator of 1; when we pick a circle of radius 2, we are choosing a denominator of 2; when we pick a circle of radius 3, we are choosing a denominator of 3; and so on. (I'm picking integers only because they're simple—you could pick literally any positive real number.) But

$$\frac{\frac{\pi}{2} \text{ arc length units}}{1 \text{ radius unit}} = \frac{\pi \text{ arc length units}}{2 \text{ radius units}} = \frac{\frac{3\pi}{2} \text{ arc length units}}{3 \text{ radius units}} = \dots = \frac{\pi}{2}.$$

So we can reasonably say, without any arbitrary choice, that the measure of a right angle is  $\frac{\pi}{2}$ . The ratio of arc length to radius doesn't change depending on which circle we pick. Given any angle, if you take an arc that subtends that angle and divide its length by its circle's radius, no matter which circle you choose, you always get the same answer. *The ratio of arc length to radius is constant for any given angle.* Sounds like we've found ourselves a consistent way to measure angles using arc lengths! This is particularly satisfying because it fits with our intuitive notion of angles as representing rotation. This way of measuring angles tells us quite straightforwardly how far the knob of our door has traveled, which is an intuitive way of picturing the size of the angle. Wonderful.

This measure of an angle—the one we get by dividing the arc length (of an arc that subtends the angle) by the radius of the circle (of which that arc is a portion)—is called the **radian measure** of an angle.

Technically speaking, the radian measure of an angle is stated in a unit called **radians**, where one radian is defined as the measure of the angle subtended by an arc on the unit circle of arc length 1—but very rarely does any mathematician write out the word “radians” or even the abbreviation “rad” next to the radian measure of an angle, and very rarely is that angle I just described, the one whose measure is 1 radian, ever used for anything. (It's also kind of ugly.<sup>3</sup>) Since the radian measure of an angle is gotten by dividing a length (an arc length) by another length (a radius), the length units cancel, leaving radians a dimensionless unit, or what mathematicians call a “pure number.”

---

<sup>3</sup> Fun exercise: explain why an angle of radian measure 1 is ugly. Or, alternatively, argue that it is beautiful. Feel free to email me with responses.

That was a lot of work! As a way of solidifying the concepts covered in the preceding pages, go ahead and read through the rigorous statements of the definitions you just learned. While learning these definitions verbatim is not necessary, you should be able to give a complete, mathematically precise definition of each of these words from memory.

**Definition (ARC).** An arc is a portion of a circle.

**Definition (SUBTEND).** An arc subtends an angle if and only if the angle's two rays pass through the arc's two endpoints.

**Definition (RADIAN MEASURE).** The radian measure of an angle is the ratio of the length of the arc that subtends the angle to the radius of the circle.

In other words, if  $s$  is the length of an arc of a circle, and  $r$  is the radius of the circle, then the central angle containing that arc measures  $\frac{s}{r}$  radians. In a circle of radius 1, the radian measure corresponds to the length of the arc.

**Definition (RADIAN).** One radian is the measure of the central angle of a circle such that the length of the arc between the initial side and the terminal side is equal to the radius of the circle.

*Complete the following exercises on a separate sheet of paper.*

**Exercise 1.** Find the radian measure of one third of a full rotation.

**Exercise 2.** Find the radian measure of three fourths of a full rotation.

**Exercise 3.** Remember that a conversion factor is a fraction, equal to one, that you multiply a measurement by to change its units. For example, to change 2 feet into inches, I multiply 2 feet by the conversion factor  $\frac{12 \text{ in}}{1 \text{ ft}}$  to get

$$2 \text{ ft} \times \frac{12 \text{ in}}{1 \text{ ft}} = 24 \text{ in.}$$

The feet cancel, leaving only inches.

Come up with conversion factors to convert from degrees to radians and from radians to degrees.

**Exercise 4.** Convert the radian measure  $\frac{\pi}{6}$  into degrees.

**Exercise 5.** Convert the radian measure  $3\pi$  into degrees.

**Exercise 6.** Convert  $15^\circ$  into radians.

**Exercise 7.** Convert  $126^\circ$  into radians.

**Exercise 8.** In a clear, neat diagram, draw the unit circle, and then sketch in standard position the following angles, given in portions of a full rotation. Then label, at the intersection of each angle's terminal side with the unit circle, the measure of that angle in both degrees and radians. (You may include the unit label "radians" or "rad" on the radian measure if you would like, but you needn't.)

$0, 1, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{3}, \frac{2}{3}, \frac{1}{6}, \frac{5}{6}, \frac{1}{8}, \frac{3}{8}, \frac{5}{8}, \frac{7}{8}, \frac{1}{12}, \frac{5}{12}, \frac{7}{12},$  and  $\frac{11}{12}$

For example, to draw and label an angle that is  $\frac{1}{4}$  of a full rotation, you would draw the standard position right angle that we were dealing with all throughout this handout (the one represented by the swinging door) and label it, at the point  $(0, 1)$ , with the labels " $90^\circ$ " and " $\frac{\pi}{2}$ ."

## Remote Learning Packet

*NB: Please keep all work produced this week. Details regarding how to turn in this work will be forthcoming.*

**April 13-17, 2020**

**Course:** Spanish II

**Teacher(s):** Ms. Barrera [anna.barrera@greatheatsirving.org](mailto:anna.barrera@greatheatsirving.org)

Supplemental links: [www.conjuguemos.com](http://www.conjuguemos.com)  
[www.spanishdict.com](http://www.spanishdict.com)

### **Weekly Plan:**

Monday, April 13

- Capítulo 4B Celebrando los días festivos -Introduction of Vocabulary in regards to family celebrations
- Capítulo 4B Celebrando los días festivos - How your family used to celebrate holidays.

Tuesday, April 14

- Capítulo 4B Celebrando los días festivos - Using the Vocabulary and applying to various situations.
- Capítulo 4B Celebrando los días festivos How you used to celebrate your birthdays.

Wednesday, April 15

- Capítulo 4B Celebrando los días festivos - Common etiquette, surprise birthday party and gathering.
- Capítulo 4B Celebrando los días festivos - Infer meaning of unfamiliar words or phrases in texts.

Thursday, April 16

- Capítulo 4B Celebrando los días festivos - The translation of manners and customs.
- Capítulo 4B Celebrando los días festivos - The translation of family celebrations.

Friday, April 17

- Capítulo 4B Celebrando los días festivos - The translation of the wedding of Abuela. Comprehension questions of the dialogue between Abuelita and Silvia. .
- Capítulo 4B Celebrando los días festivos. Retelling the story of your parent's wedding

### **Statement of Academic Honesty**

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

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Student Signature

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Parent Signature

## **Monday, April 13 Please write all your answers in a loose-leaf paper.**

Capítulo 4B Celebrando los días festivos -Introduction of Vocabulary in regards to family celebrations.

1.**Guided Practice Activities** - Handouts *Vocabulary Flashcards* Sheets 1-4. Fill in the flashcards with the appropriate new vocabulary.

2.**Guided Practice Activities** - Handouts *Vocabulary Check* Sheets 1-4. Translate with the appropriate vocabulary.

## **Tuesday, April 14 Google docs adds in accents only when it wants to but you know that some verbs are in the past according to the situation.**

Capítulo 4B Celebrando los días festivos - Using the Vocabulary and applying to various situations.

1.**Core Practice Activity 4B-1** *Que Pasa?* Tell what these people are doing by filling in the missing words from the word bank.

2.**Core Practice Activity 4B -2** *Cual es la costumbre?* Fill in with the appropriate vocabulary according to the illustration and analogies.

3.**Core Practice Activity 4B-3** *Falta una palabra.* Complete the sentences with the missing words.

## **Wednesday, April 15**

Capítulo 4B Celebrando los días festivos - Common etiquette, surprise birthday party and gathering. Infer meaning of unfamiliar words or phrases in texts.

I. **Textbook pp. 212-213** *Vocabulario en Contexto* - Translate the dialogue between abuela and abuelo.

II. **Textbook pp. 212-213** *Vocabulario en Contexto*: Read the dialogue and then answer the following questions: 1. Por que le encanto a la abuela el aniversario? 2. Por qué se sorprendió la abuela con Felipe?

3. Para el abuelo que dice que es importante cuando uno asiste una fiesta? 4. Cuales son los recuerdos del abuelo en el cumpleaños de Marcos? 5. Que hacían los jóvenes en la fiesta? 6. Que les encantó a los jóvenes?

## **Thursday, April 16**

Capítulo 4B Celebrando los días festivos - The translation of celebrations and etiquette.

I. Translate the following sentences having to do with manners and customs.

1. Hay que darse la mano cuando saludas a otra persona.
2. Es bueno sonreir y ser sociable.
3. Si el chiste es bueno, puedes reirte.
4. Las personas dicen “adiós” cuando se despiden.
5. Muchos parientes se abrazan.
6. Es normal charlar con tus amigos.

II. Translate the following sentences having to do with a celebration.

1. Hicieron un picnic para celebrar.
2. Había 20 personas en la fiesta.
3. Fue una fiesta para mayores.

4. En la noche hubo fuegos artificiales.
5. La fiesta de sorpresa fue en una casa.
6. Los jóvenes contaron chistes.
7. Hubo un pastel enorme.

## Friday, April 17

Capítulo 4B Celebrando los días festivos - The translation of the wedding of Abuela. Comprehension questions of the dialogue between Abuelita and Silvia. Retelling the story of your parent's wedding.

1. **Textbook. p. 214** Translate the *dialogue* between Abuelita and Silvia.
2. **Textbook p. 214 Activity 3** *Cuando se casaron los abuelos*. Read the following sentences and then decide if it's Cierto o Falso. If it is False then rewrite the correct (Cierto) sentence.
3. **Writing:** Interview your parents or other parents about their wedding. In a paragraph of 8 sentences retell the story by writing it using the preterite and imperfect tense. Use the vocabulary from Chapter 4B and any other vocabulary that you have learned. Don't forget to use transitional words.



Nombre \_\_\_\_\_

Nombre \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Flash Cards, Sheet 1**

Write the Spanish vocabulary word or phrase below each picture. Be sure to include the article for each noun.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



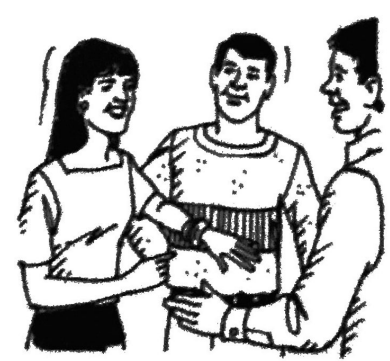
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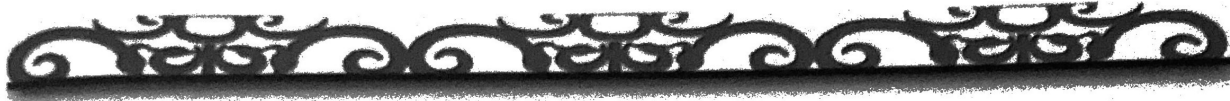
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Nombre \_\_\_\_\_

Hora \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Flash Cards, Sheet 2**

Write the Spanish vocabulary word or phrase below each picture. Be sure to include the article for each noun.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_  
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_  
\_\_\_\_\_



\_\_\_\_\_  
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_  
\_\_\_\_\_

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**Capítulo 4B**

Write the Spanish vocabulary word below each picture. If there is a word or phrase, copy it in the space provided. Be sure to include the article for each noun.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

**llevarse bien,  
llevarse mal**

\_\_\_\_\_

**felicitar**

\_\_\_\_\_

**los  
parientes**

\_\_\_\_\_

**alrededor de**

\_\_\_\_\_

**la  
costumbre**

\_\_\_\_\_

**divertirse**

\_\_\_\_\_



Nombre \_\_\_\_\_

Hora \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Flash Cards, Sheet 4**

Copy the word or phrase in the space provided. Be sure to include the article for each noun.

**nacer**

**la  
reunión**

**antiguo,  
antigua**

**frecuentemente**

**había**

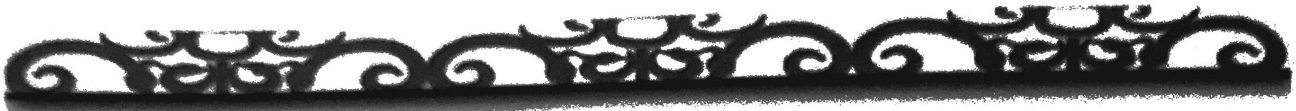
**mientras (que)**

**recordar**

**el día  
festivo**

**¡Felicidades!**

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Nombre \_\_\_\_\_

Hora \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Check, Sheet 1**

Tear out this page. Write the English words on the lines. Fold the paper along the dotted line to see the correct answers so you can check your work.

el bebé, la bebé \_\_\_\_\_

el aniversario \_\_\_\_\_

la costumbre \_\_\_\_\_

el desfile \_\_\_\_\_

el día festivo \_\_\_\_\_

la fiesta de sorpresa \_\_\_\_\_

los fuegos artificiales \_\_\_\_\_

la reunión \_\_\_\_\_

los mayores \_\_\_\_\_

los modales \_\_\_\_\_

abrazar(se) \_\_\_\_\_

besar(se) \_\_\_\_\_

dar(se) la mano \_\_\_\_\_

Fold In



Nombre \_\_\_\_\_

Hora \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Check, Sheet 2**

Tear out this page. Write the Spanish words on the lines. Fold the paper along the dotted line to see the correct answers so you can check your work.

- baby \_\_\_\_\_
- anniversary \_\_\_\_\_
- custom \_\_\_\_\_
- parade \_\_\_\_\_
- holiday \_\_\_\_\_
- surprise party \_\_\_\_\_
  
- fireworks \_\_\_\_\_
  
- gathering \_\_\_\_\_
- grown-ups \_\_\_\_\_
- manners \_\_\_\_\_
- to hug \_\_\_\_\_
- to kiss \_\_\_\_\_
- to shake hands \_\_\_\_\_

Fold In  
↓



Nombre \_\_\_\_\_

Fecha \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Check, Sheet 3**

Tear out this page. Write the English words on the lines. Fold the paper along the dotted line to see the correct answers so you can check your work.

despedirse (de) \_\_\_\_\_

saludar(se) \_\_\_\_\_

sonreír \_\_\_\_\_

contar (chistes) \_\_\_\_\_

llorar \_\_\_\_\_

reírse \_\_\_\_\_

reunirse \_\_\_\_\_

casarse (con) \_\_\_\_\_

charlar \_\_\_\_\_

cumplir años \_\_\_\_\_

hacer un picnic \_\_\_\_\_

nacer \_\_\_\_\_

regalar \_\_\_\_\_

recordar \_\_\_\_\_

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fold  
in  
↓



Nombre \_\_\_\_\_ Hora \_\_\_\_\_

**Capítulo 4B**

Fecha \_\_\_\_\_

**Vocabulary Check, Sheet 4**

Tear out this page. Write the Spanish words on the lines. Fold the paper along the dotted line to see the correct answers so you can check your work.

to say goodbye (to) \_\_\_\_\_

to greet \_\_\_\_\_

to smile \_\_\_\_\_

to tell (jokes) \_\_\_\_\_

to cry \_\_\_\_\_

to laugh \_\_\_\_\_

to meet \_\_\_\_\_

to get married (to) \_\_\_\_\_

to chat \_\_\_\_\_

to have a birthday \_\_\_\_\_

to have a picnic \_\_\_\_\_

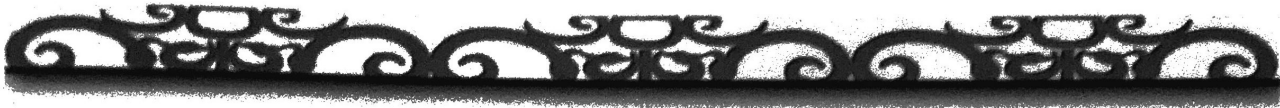
to be born \_\_\_\_\_

to give (a gift) \_\_\_\_\_

to remember \_\_\_\_\_

Fold In ↓

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Nombre \_\_\_\_\_

Hora \_\_\_\_\_

## Capítulo 4B

Fecha \_\_\_\_\_

Core Practice **4B-1**

### ¿Qué pasa?

Tell what these people are doing by filling in the missing words from the word bank. Not all of the words will be used.

lloran	nació	se ríen
fuegos artificiales	modales	parientes
reunión	cuentan	antiguo
cumplió		había
fiesta de sorpresa		se reúnen

1. Hay una \_\_\_\_\_ de la familia en casa de los abuelos el domingo.
2. Los chicos \_\_\_\_\_ cuando les cuento chistes.
3. El bebé \_\_\_\_\_ la semana pasada.
4. Elena y Tomás \_\_\_\_\_ a las nueve cada noche en la Plaza Mayor.
5. Berta no sabía que la \_\_\_\_\_ era para ella.
6. A la gente estadounidense le gusta ver los \_\_\_\_\_ para celebrar el cuatro de julio.
7. Para los días festivos todos los \_\_\_\_\_ se reúnen y hablan de cuando eran niños.
8. Muchas personas \_\_\_\_\_ en una boda porque están contentos.
9. Un regalo bueno para la boda es un reloj \_\_\_\_\_.
10. Mi padre \_\_\_\_\_ sesenta años el mes pasado.



**¿Cuál es la costumbre?**

**A.** Complete each of the following analogies with a word from your vocabulary.

1. niños : bebés :: ancianos : \_\_\_\_\_
2. abrir : cerrar :: despedir : \_\_\_\_\_
3. llevar : traer :: pasarlo bien : \_\_\_\_\_
4. flojo : apretado :: pequeño : \_\_\_\_\_
5. siempre : de vez en cuando :: nunca : \_\_\_\_\_

**B.** Tell what the following people do every day.



1. Tito y Celia se \_\_\_\_\_.



2. Paco se \_\_\_\_\_ de Ramón.



3. Nieves y Lorena se \_\_\_\_\_.



4. Gabriel le \_\_\_\_\_ al amigo de Josefina.



5. Marta y Paco se \_\_\_\_\_ en la fiesta.



6. Alejandro \_\_\_\_\_ cuando se reúne con los parientes.

Nombre \_\_\_\_\_

Hora \_\_\_\_\_

## Capítulo 4B

Fecha \_\_\_\_\_

Core Practice **4B-3**

### Falta una palabra

Complete the following sentences with the missing word.

1. La Navidad y el cuatro de julio son días \_\_\_\_\_ y \_\_\_\_\_.
2. Juan siempre \_\_\_\_\_ u \_\_\_\_\_ muchos chistes.
3. Cuando mis padres llegaron a la fiesta para su aniversario, todos gritamos,  
i \_\_\_\_\_ d \_\_\_\_\_ d \_\_\_\_\_!
4. Álvaro mostró buenos \_\_\_\_\_ m \_\_\_\_\_ porque charló con toda la gente.
5. La \_\_\_\_\_ é nació ayer en el hospital.
6. Los hermanos se \_\_\_\_\_ v \_\_\_\_\_ muy bien. Nunca pelean.
7. El domingo vamos a hacer \_\_\_\_\_ n \_\_\_\_\_ n \_\_\_\_\_. Tenemos mucha comida y va a hacer buen tiempo.
8. Marta caminó \_\_\_\_\_ r \_\_\_\_\_ r del parque tres veces.
9. No \_\_\_\_\_ r \_\_\_\_\_ o qué hicimos para el seis de enero. Quizás tuvimos una fiesta.
10. Mis parientes siempre \_\_\_\_\_ r \_\_\_\_\_ l \_\_\_\_\_ con sus amigos por teléfono.



Nombre \_\_\_\_\_

Hora \_\_\_\_\_

## Capítulo 4B

Fecha \_\_\_\_\_

Core Practice **4B-1**

### ¿Qué pasa?

Tell what these people are doing by filling in the missing words from the word bank. Not all of the words will be used.

lloran	nació	se ríen
fuegos artificiales	modales	parientes
reunión	cuentan	antiguo
cumplió		había
fiesta de sorpresa		se reúnen

1. Hay una reunión de la familia en casa de los abuelos el domingo.
2. Los chicos se ríen cuando les cuento chistes.
3. El bebé nació la semana pasada.
4. Elena y Tomás se reúnen a las nueve cada noche en la Plaza Mayor.
5. Berta no sabía que la fiesta de sorpresa era para ella.
6. A la gente estadounidense le gusta ver los fuegos artificiales para celebrar el cuatro de julio.
7. Para los días festivos todos los parientes se reúnen y hablan de cuando eran niños.
8. Muchas personas lloran en una boda porque están contentos.
9. Un regalo bueno para la boda es un reloj antiguo.
10. Mi padre cumplió sesenta años el mes pasado.

**¿Cuál es la costumbre?**

A. Complete each of the following analogies with a word from your vocabulary.

1. niños : bebés :: ancianos : mayores
2. abrir : cerrar :: despedir : saludar
3. llevar : traer :: pasarlo bien : divertirse
4. flojo : apretado :: pequeño : enorme
5. siempre : de vez en cuando :: nunca : frecuentemente

B. Tell what the following people do every day.



1. Tito y Celia se abrazan.



2. Paco se despide de Ramón.



3. Nieves y Lorena se besan.



4. Gabriel le da la mano al amigo de Josefina.



5. Marta y Paco se saludan en la fiesta.



6. Alejandro sonríe cuando se reúne con los parientes.

**Falta una palabra**

Complete the following sentences with the missing word.

1. La Navidad y el cuatro de julio son días f e s t i v o s.
2. Juan siempre c u e n t a muchos chistes.
3. Cuando mis padres llegaron a la fiesta para su aniversario, todos gritamos,  
¡F e l i c i d a d e s!
4. Álvaro mostró buenos m o d a l e s porque charló con toda la gente.
5. La b e b é nació ayer en el hospital.
6. Los hermanos se l l e v a n muy bien. Nunca pelean.
7. El domingo vamos a hacer u n p i c n i c. Tenemos mucha comida y va a hacer buen tiempo.
8. Marta caminó a l r e d e d o r del parque tres veces.
9. No r e c u e r d o qué hicimos para el seis de enero. Quizás tuvimos una fiesta.
10. Mis parientes siempre c h a r l a n con sus amigos por teléfono.