9th Grade Lesson Plan Packet

5/25/2020-5/29/2020

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020

Course: 9 Biology

Teacher(s): Mr. Malpiedi michael.malpiedi@greatheartsirving.org
Ms. Oostindie megan.oostindie@greatheartsirving.org

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

Science doesn't stop with the school year. We've included a list of things you can do all summer to keep wondering. Also, life is the opposite of stasis. What keeps things alive is perpetual activity. Stay alive. Keep doing things. Go out and observe the continual motion of the cosmos.

Please choose one of these things and do it. You are welcome to include siblings, parents, classmates. Try and complete each one of these by the end of the summer.

Germinate Something

Background: germ: mid-15c., "bud, sprout;" 1640s, "rudiment of a new organism in an existing one," from Middle French *germe* "germ (of egg); bud, seed, fruit; offering," from Latin *germen* (genitive *germinis*) "spring, offshoot; sprout, bud." Germination unlocks the potency of life in the seed before it bursts and begins growth. In some fragile plants like lavender, germination in a separate environment is necessary before plants can be planted.

Materials: Water, gallon or quart size plastic baggie, 2 paper towels, water, seeds, and sunlight.

Method:

1. Thoroughly wet both paper towels so they are soaked but not dripping.
2. Arrange the paper towels one on top of the other and place them inside the baggie.
3. Place your seeds between the paper towels, and close the bag.
4. Place the bag near a window that gets lots of light - preferably one that faces south.
5. Check to ensure your seeds are moist every day. Add water as needed.
6. Once your plant has sprouted into a seedling, plant it in the dirt and watch it take off.

Conclusion: How long did germination take? How does it change day to day? How is a germinated seed different from a plant? How is it similar? Where is all that green matter coming from?

Additional study (optional): Research ideal growing times/conditions for your seeds and start a garden!

Plant Something

Background: You can't actually "grow" anything, but you *can* learn enough to cooperate with and foster the intrinsic property of growth of various plants.

Method:

1. Plant something: your seedling, a flower, seeds, etc. in a few inches of dark, damp earth. If not, pick a plant that's already growing and "adopt" it.
2. Water it gently every day, except on rainy days.
3. Use your lab skills to record observations on a regular basis. Observe as many of the 10 categories as you can *every time*. Take a note of plant height, color, number of leaves, new developments, wiltiness, etc.
4. Synthesize your findings in a chart.
5. Graph the change over time of a particular property. Time is your x-axis.

Conclusion: Most things grow so slowly, we can't recognize the change from day to day! IT's the work of the curious scientist to track those minor changes and then learn from them. By tracking how water, sun, temperature, and soil composition affects plant growth, we can learn about the nature of plant species.

Additional Study (Optional): Email Mr. Althage and ask him about grafting.

Watch Planet Earth and Planet Earth II on Netflix (Optional)

Background: Until you go to remote corners of the earth on your *own* research grant, take advantage of the beautiful work the Discovery Channel people have done. The Planet Earth series is what we call a species study, which focuses on particular species one at a time. What have you learned about ecosystems that you see here?

Method:

1. Gain access to the Planet Earth series (Netflix, local library, the cabinet).
2. Put your other devices in another room.
3. Make some popcorn.
4. Grab your notebook and something to write with.
5. Watch an episode, eat popcorn, and take notes on what amazes you.

Conclusion: How are species related? What are the driving forces of nature? Does nature as a whole work toward an end? Can we learn what that end is?

Additional Study (Optional): Practice your David Attenborough impression.

Species Survey

Background: The art of observation can reveal much that isn't registered by a passing eye. Taking the time to investigate what's *really* in front of us almost always renders worthy results. This particular activity is used by scientists the world over to make investigations and draw conclusions about the world around us. Species surveys provide essential ecological insights.

Method:

1. Construct a one-meter square with yardsticks, PVC, etc.
2. Place it on a random patch of natural ground (no concrete, please!)

3. Guess how many different species of living thing you might find within that square. Write it down.
4. Count and describe *every single* species of living thing you find within that square.
5. Write down your findings.

Conclusion: How did your results differ from your guess? Why? What do your results tell you about this parcel of land, this region, this county, this state, this biome? Did you find any very strange species? Did you find two very similar species that were hard to tell apart? How did you tell them apart? Did you find insects, arachnids, birds or mammals among the plants? Does the number you found seem reasonable? Why?

Go Birding

Background: Birding can become a lifelong hobby! Birding is different than birdwatching. Birding is more scientific and in-depth. Most birders out there have formation in the sciences, and love finding rare or unusual species wherever possible. There are also rich birding communities in most towns invested in finding and tracking species of birds all over the world. In Texas, bird species are usually registered by county.

Method:

1. Purchase or check out a bird guide (Sibley is good) from the library, or find a pdf online.
2. Go to a park or avian reserve area (around dawn or dusk are more active times).
3. Listen and watch for birds.
4. Make a note of which birds you hear and see.
5. ebird.com is a very cool way to see what's out there, and keep track of your own progress!

Conclusion: How many birds did you find? Which ones? How did you spot them? Which was your favorite to spot? Why? Where are you going next?

Cardio Study

Background: Human biology is not only available via textbook. Every activity you do is biological in some way, and thus can offer insight into human bio generally! It is particularly evident in the cardiovascular system.

Method:

1. Make a cardio plan of running, biking, swimming, jumping jacks, going up stairs, burpees, etc three times per week.
2. Follow your plan! If it's too hard or too easy, adjust.
3. Use your watch (or fitbit or grandfather clock) to track your heart rate in beats per minute.
4. Measure your heart rate before, during, and after exercise every day (remember that lab?).
5. Make a graph of your measurements over the course of 4 weeks or more this summer.

Conclusion:

Regular cardiovascular exercise has been proven to improve the efficiency of your entire cardiovascular system, meaning your body can do more with less exertion. This means that over time, with regular exercise, your resting heart rate can actually decrease while still supplying your cells with sufficient oxygen. Also, you will probably notice your recovery times decrease. The best athletes can have resting heart rates below 40 bpm!

Remote Learning Packet

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Week 9: May 25-29, 2020

Course: 9 Geometry

Teacher(s): Mr. Mooney sean.mooney@greatheartsirving.org

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

Dear Students,

I hope you all are doing well! This week, there is just a single assignment, in two chapters. It is a little something I wrote, about sides and angles in triangles (trigonometry) and some other interesting ratios. It is intended to be *a combination of reading and discovery*. You may simply read through it all without stopping to really think on your own, and then it shouldn't take very long at all--but that wouldn't be any fun! There are a few challenging problems that I pose for you to solve, and I really, really encourage you, at those points, to stop reading, grab a pencil and paper, and try to work out the solutions for yourself. I won't be collecting any of the work that you do this week, so it does not have to be organized or neat or even legible to anyone but yourself! The point of the work that you do this week is, simply and purely, for your own enjoyment and intellectual growth.

And then, that is it! You will have completed your 9th grade study of Geometry.[1] You have come to know and understand the first half of Euclid's *Elements*, the standard of Geometry education for the last 2,500 or so years. This is no easy task! The depth that we went to in this class surpasses most high school and even college geometry courses these days. I am proud of all of you and how far you have come as mathematicians, scholars, and, in general, great-hearted young men and women. Your diligence in your studies and especially your eagerness to understand made it a true joy for me to teach you. I am very sad that we cannot end the year together, that I cannot tell you these things in person, but alas it is not possible. Do not be surprised if, at the beginning of next year, I come and interrupt your 10th grade math class to tell you how great you all are.

I wish you all a wonderful summer--full of recreation and true, good, and beautiful things--and I look forward to seeing you in the Fall.

Sincerely,
Mr. Mooney

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[1] But only just started your life-long pursuit of it! In fact, I have suggestions for further study / summer reading if any of you would like it. Just email me!

Chapter One: Trigonometric Ratios

The Relationship of Angles and Sides in Triangles

You may have noticed in our study of Euclid's *Elements* a recurring question: what is the relationship of sides and angles in triangles? The question came up in many forms, and many propositions brought us a greater understanding. For example, we saw in I.5 and I.6 that equal angles and equal sides always go together in a single triangle, and then we saw in I.18 and I.19 that, if the angles are unequal, the greater side always subtends the greater angle.

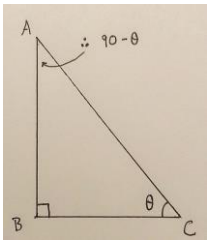
Now, having studied ratio and proportion, we might be wondering: how *exactly* do angles affect sides? By widening an angle by a certain amount, *how much longer* is the subtending side? Are sides and angles within a triangle proportional? Or is there some different kind of relation?

The truth is that angles and sides *are* related, and the answer does indeed lie in ratio and proportion, but not in the way that you might think. Let's take a look!

The Fundamental Theorem of Trigonometry

There is a special branch of Geometry that deals with this question, and it is called *Trigonometry*. The "-metry" part of the word comes from the Greek word meaning *measure*. The "Trigono-" part of the word comes from the Greek word (*trigonos)* meaning *triangle*.[1] So Trigonometry is simply "triangle measure"; and it deals with questions about the relationship of sides and angles in Triangles.

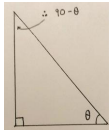
The beginning of Trigonometry is a simple realization, combining the truths of I.32 and VI.4. To see it, let's consider the right triangle ABC. Let's say that one of its acute angles has a measure of θ (pronounced "theta," a Greek letter often used to represent angle measures).

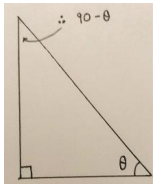


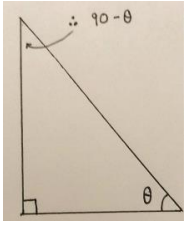
Now, since we know from I.32 that all triangles have angles that add up to two right angles, and since this triangle already has a right angle, we can know that the other two angles must add to one right angle, and therefore the remaining angle is $90 - \theta$.

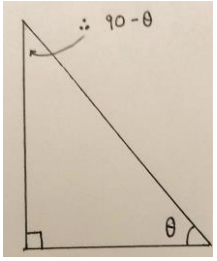
Now imagine another right triangle DEF, with a right angle and one acute angle with a measure of θ. Wouldn't it *also* have a remaining angle of $90 - \theta$, by the same reasoning?

This means that every right triangle having an acute angle with a certain measure is equiangular and therefore similar (VI.4) to every other right triangle having an acute angle of that same measure. Or, put shortly: *every right triangle with an angle of θ is similar.*



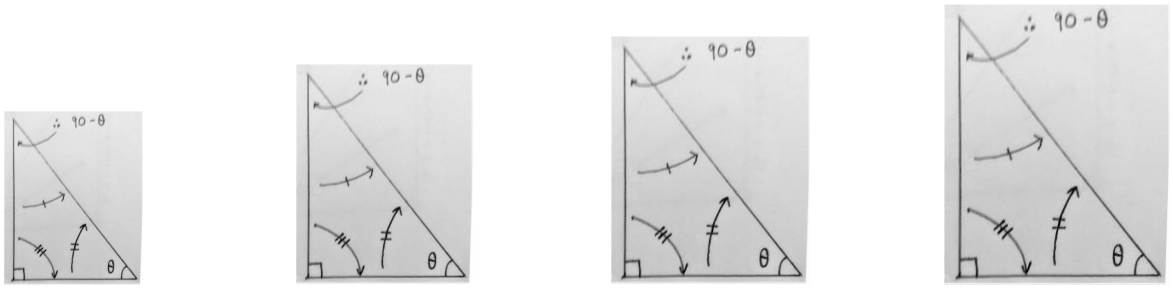






[1] Interesting to note that *trigonos* is actually a combination of *tri*, meaning three, and *gon*, meaning side. So the Greeks called it a "tri-side" while we say "tri-angle."

But similar triangles have sides that are in the same ratio: see the equal ratios in these triangles below:



This means that in every right triangle with an angle of θ, all the sides have constant ratios! Said another way:

In right triangles, the ratios of sides are uniquely determined by the measure of one acute angle.

If you think of a right triangle and you say one of the angles is, for example, 30 degrees, then it will have ratios of sides that are the same as in *every* 30-degree right triangle. If we could figure out what those ratios are for our particular 30-degree triangle, we would know what they are for all of them.

Trigonometric Ratios: SOH CAH TOA

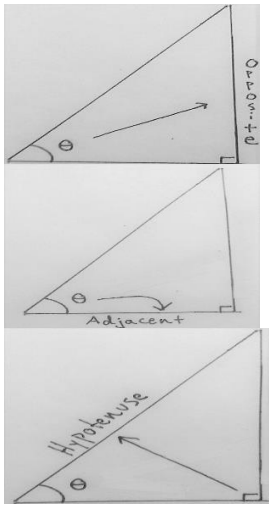
We will soon begin to investigate what the numerical values of these ratios are, but before we do, it is helpful to have some vocabulary for referring to specific ratios.

First, a way to <u>name the sides</u> of the triangle that you are talking about. From the perspective of the angle in question (θ) there are three names that we can give to the sides.

There is the side **opposite** the angle.

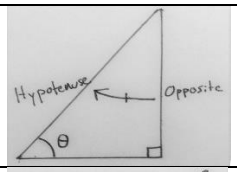
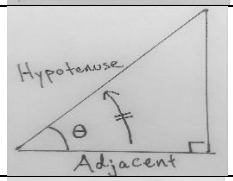
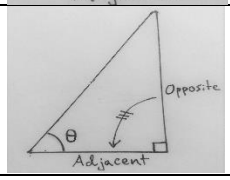
There is the side **adjacent** to the angle.

And then there is the **hypotenuse**. [2]



If we look at this right triangle, and we are thinking about how the measure of our angle would affect the ratios of the sides of the triangle, we see that there are three ratios to talk about.

[2] Since the hypotenuse is always *opposite* the right angle, and we will only ever be thinking about ratios in terms of the acute angles, we will never get "opposite" and "hypotenuse" mixed up. Also, since the hypotenuse will always be *adjacent* to the acute angles, we name the side "adjacent" which is adjacent to the angle but is not the hypotenuse.

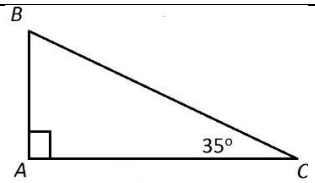
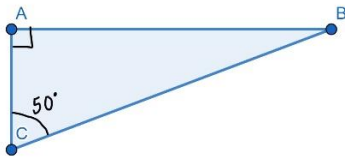
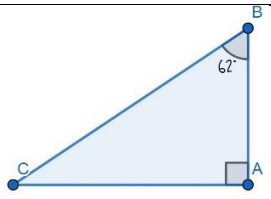
There is the ratio of the **opposite** to the **hypotenuse**.		We call this ratio the **Sine**.
There is the ratio of the **adjacent** to the **hypotenuse**.		We call this ratio the **Cosine**.
And then there is the ratio of the **opposite** to the **adjacent**.		We call this ratio the **Tangent.**

To remember these names in a convenient way, people remember "Soh Cah Toa." Try saying it out loud—it is rather fun to say. Soh Cah Toa! Soh Cah Toa! Soh Cah Toa!

Ok, maybe a little silly, but it's helpful! "SOH" stands for "**S**ine is **O**pposite: **H**ypotenuse." "CAH" stands for "**C**osine is **A**djacent : **H**ypotenuse." And "TOA" stands for "**T**angent is **O**pposite : **A**djacent."

We use these words—Sine, Cosine, and Tangent—in the following way. If we were wondering about the ratio of the opposite side to the hypotenuse when there is a 30-degree acute angle, we would say: "*What is the **sine** of 30 degrees*?"

This may take some getting used to. Please keep in mind that, even though we say "of 30 degrees," we are not exactly speaking about the 30-degree angle; we are talking about a specific *ratio of sides* that occurs when there is 30-degree angle in a triangle. Let's practice with this a bit.

In this triangle, what is the sine of 35 degrees? (Also written Sin50)		Sin35 = AB:AC
In this triangle, what is the cosine of 50 degrees? (Also written Cos50)		Cos50 = AC:BC
In this triangle, what is the tangent of 70 degrees? (Also written Tan70)		Tan62 = AC:AB

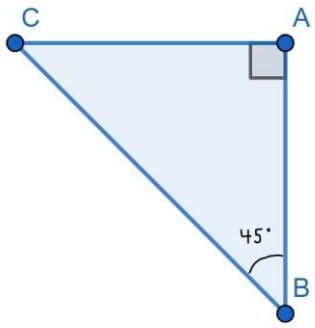
Getting the hang of it? Great! Now it's time for the real meat and potatoes of our inquiry.

Discovering Particular Trigonometric Ratios for Particular Angles

We said that the measure of an acute angle in a right triangle uniquely determines the ratios of sides. That is, since all right triangles with a 45-degree acute angle are similar, the **sine** of 45 degrees—the ratio of the opposite side to the hypotenuse—will *always be the same no matter which triangle it is*! If we were able to figure out what exactly that sine ratio is in one triangle (is it a 1:2 ratio? a 3:4 ratio? a 5:3 ratio? etc.) then we would know what the ratio is *in every 45-degree-angle triangle*.

And that is, indeed, the question that we will begin with. *What are the sine, cosine, and tangent ratios in a right triangle with respect to a 45-degree angle?*

We are looking for a particular numerical value for the ratio: as we noted above, something like 1:2, or 5:3. But looking at the diagram of ABC to the right, we might wonder how it is possible to get any numbers out of it. We don't know the length of any of them!



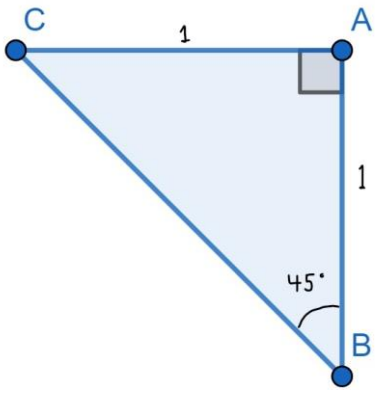
The trick here is that, since we know that all 45-degree right triangles are similar, *we can choose a length to get us started and it does not matter what length we choose*. We cannot choose *all* of the lengths, because then we would be determining the shape of the triangle in a way not based on the angle, but if we choose one side length and figure out the others based on it, we will not distort the shape.

So let's say that the length of AB is 1. Now, *can we find the length of the other sides?* Now if the angle we are looking at is 45 degrees, what is the measure of the other angle? Knowing that they all must add up to 180 degrees, we can see that the remaining angle is also 45 degrees, making this an isosceles triangle. Therefore, if we say AB is 1, then BC also equals 1.

And already we are able to answer one of our questions: what is the **tangent** of 45 degrees? Remember that tangent is the ratio of the side opposite our angle to the side adjacent to our angle. Here, we have a 1:1 ratio of sides. We can therefore say that Tan45 = 1. (And do you see that, had you chosen 3 as your length for AB, then BC would also have to be 3, and you would get a 3:3 ratio, which is equivalent to a 1:1 ratio. $\frac{1}{1} = \frac{3}{3} = 1$. The same, of course, would be true for any number you originally chose.)

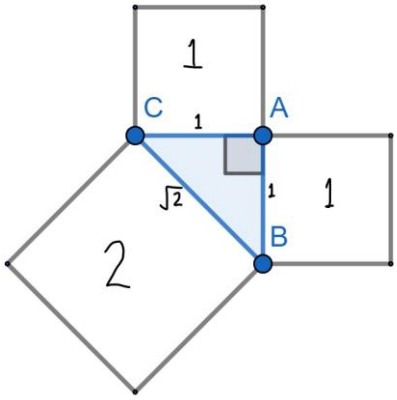
Thus we have the tangent of 45 degrees! This is a great success! 45-degree angles in right triangles will always result in a 1:1 ratio of opposite and adjacent sides. But how to determine the sine and cosine? These both involve the hypotenuse, whose length we do not know yet.

I don't want to give away all of the fun of discovery, so let me pause here and let you try to discover it on your own.



Try to discover the length of the hypotenuse, and then use that to discover the remaining ratios: sin45 and cos45. The solution will follow on the next page but, to get you started, let me give you a little hint: think about that very important and glorious Book I proposition that tells us about the relation of sides of a right triangle!

How did it go? Did you find them? If you discovered them on your own, you noticed that the way to determine the length of the hypotenuse was with the Pythagorean theorem (I.47). If each of the legs have lengths of 1, then the squares on them have areas of 1. But the area of the square on the hypotenuse equals the sum of the areas of the squares on the legs. Therefore, the area of the square on the hypotenuse is equal to 2.



To determine the length of the side of the square, we just need to ask *what number times itself makes two?* This should ring a bell from last year: the answer to that question is the square root of two (written $\sqrt{2}$).

Therefore, the sine of 45 degrees is the ratio 1: $\sqrt{2}$. And the cosine of 45 is also 1: $\sqrt{2}$.

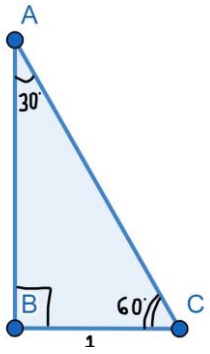
Thus, sin45 =$\frac{1}{\sqrt{2}}$, cos45=$\frac{1}{\sqrt{2}}$, and tan45 = 1. The sine and cosine can be further simplified or turned into decimals, but we will leave them as they are for now.[3]

Congratulations, we have discovered our very first trig ratios! These values are universal, and are the same for *every 45-degree right triangle!*

Let's try to discover some more! You'll notice that the 45-degree angle was a nice choice because it resulted in an isosceles triangle. Not all angles work out so nicely. Here is one that, while trickier than 45 degrees, also has a solution that, with a little creativity, we can come to on our own.

Find the sine, cosine, and tangent of 30 degrees. Then, while you're at it, *find the sine, cosine, and tangent of 60 degrees*. (I say "while you're at it," because when one angle in a right triangle is 30 degrees, the other angle is 60 degrees.)

To help you get started on this, let's choose the length of one side. Let's make BC = 1. If you would like a very helpful hint, see the footnote at the bottom of this page.[4] The solution will follow on the next page.

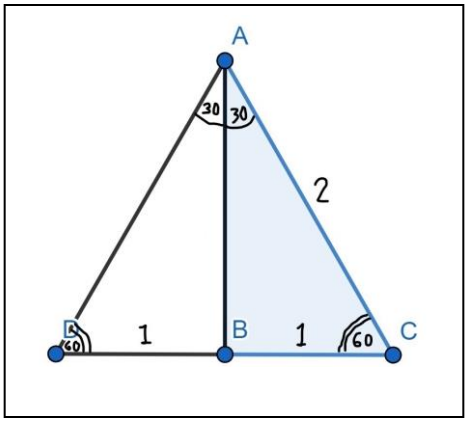


[3] Those of you familiar with the "no roots in the denominator" rule and the trick for simplifying them will know that it is more proper to write the sine and cosine ratios as $\frac{\sqrt{2}}{2}$.

[4] Since 60 degrees is the angle measure of an equilateral triangle, try turning your triangle into the half of a larger equilateral triangle. That may help you find a second side length. (And if you find a second side length of a right triangle, you know how to find the third!)

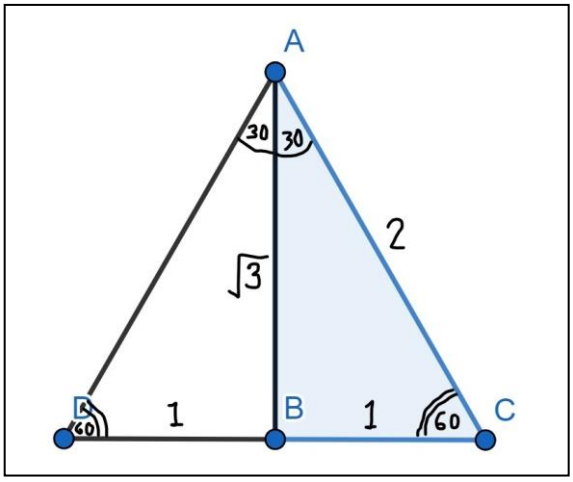
How did it go? We will go through the solution in steps, so if you have not gotten the solution yet, and you read something helpful here, I encourage you to stop, go back to the previous page, and see if you can get it from there.

The first trick is, as I said in the footnote hint, to make your triangle the one half of a larger equilateral triangle, by creating a congruent triangle on the other side of AB:



Therefore, since all the angles would be 60 degrees each, the triangle is equilateral. Furthermore, since each half would be congruent, if BC = 1, then the whole DC would have to equal 2. That in turn, since the triangle is equilateral, would mean that AC is also equal to 2. And we have a second side length!

From there, we can reason by I.47 to the length of the third side of our original right triangle.



The square on 2 would have an area of four, and the square on 1 would have an area of 1. Therefore, the square on the other leg would have to have an area of 3. Therefore, the length of the remaining side must be the square root of three: $\sqrt{3}$.

Therefore, the trigonometric ratios are as follows:

$sin30 = \frac{1}{2}$ $cos30 = \frac{\sqrt{3}}{2}$ $tan30 = \frac{1}{\sqrt{3}}$

$sin60 = \frac{\sqrt{3}}{2}$ $cos60 = \frac{1}{2}$ $tan60 = \frac{\sqrt{3}}{1}$

Congratulations! You have discovered the trigonometric ratios for a total of three different angle measures! This is no small accomplishment.

Though we won't do this ourselves, mathematicians have found ways of knowing the ratios for any acute angle measure, and have organized them into a chart called a "Table of Trigonometric Values," as you can see for yourself below. You will see that there is a numerical value for the sine, cosine, and tangent ratios for every whole-number angle between 0 and 90 degrees.[5]

[5] What would it mean to have a trigonometric ratio of 0 or 90 degrees? Is that possible?

Trigonometry Table

A	SIN(A)	COS(A)	Tan(A)
0	0.0000	1.0000	0.0000
1	0.0175	0.9998	0.0175
2	0.0349	0.9994	0.0349
3	0.0523	0.9986	0.0524
4	0.0698	0.9976	0.0699
5	0.0872	0.9962	0.0875
6	0.1045	0.9945	0.1051
7	0.1219	0.9925	0.1228
8	0.1392	0.9903	0.1405
9	0.1564	0.9877	0.1584
10	0.1736	0.9848	0.1763
11	0.1908	0.9816	0.1944
12	0.2079	0.9781	0.2126
13	0.2250	0.9744	0.2309
14	0.2419	0.9703	0.2493
15	0.2588	0.9659	0.2679
16	0.2756	0.9613	0.2867
17	0.2924	0.9563	0.3057
18	0.3090	0.9511	0.3249
19	0.3256	0.9455	0.3443
20	0.3420	0.9397	0.3640
21	0.3584	0.9336	0.3839
22	0.3746	0.9272	0.4040
23	0.3907	0.9205	0.4245
24	0.4067	0.9135	0.4452
25	0.4226	0.9063	0.4663
26	0.4384	0.8988	0.4877
27	0.4540	0.8910	0.5095
28	0.4695	0.8829	0.5317
29	0.4848	0.8746	0.5543
30	0.5000	0.8660	0.5774
31	0.5150	0.8572	0.6009
32	0.5299	0.8480	0.6249
33	0.5446	0.8387	0.6494
34	0.5592	0.8290	0.6745
35	0.5736	0.8192	0.7002
36	0.5878	0.8090	0.7265
37	0.6018	0.7986	0.7536
38	0.6157	0.7880	0.7813
39	0.6293	0.7771	0.8098
40	0.6428	0.7660	0.8391
41	0.6561	0.7547	0.8693
42	0.6691	0.7431	0.9004
43	0.6820	0.7314	0.9325
44	0.6947	0.7193	0.9657
45	0.7071	0.7071	1.0000

A	SIN(A)	COS(A)	Tan(A)
45	0.7071	0.7071	1.0000
46	0.7193	0.6947	1.0355
47	0.7314	0.6820	1.0724
48	0.7431	0.6691	1.1106
49	0.7547	0.6561	1.1504
50	0.7660	0.6428	1.1918
51	0.7771	0.6293	1.2349
52	0.7880	0.6157	1.2799
53	0.7986	0.6018	1.3270
54	0.8090	0.5878	1.3764
55	0.8192	0.5736	1.4281
56	0.8290	0.5592	1.4826
57	0.8387	0.5446	1.5399
58	0.8480	0.5299	1.6003
59	0.8572	0.5150	1.6643
60	0.8660	0.5000	1.7321
61	0.8746	0.4848	1.8040
62	0.8829	0.4695	1.8807
63	0.8910	0.4540	1.9626
64	0.8988	0.4384	2.0503
65	0.9063	0.4226	2.1445
66	0.9135	0.4067	2.2460
67	0.9205	0.3907	2.3559
68	0.9272	0.3746	2.4751
69	0.9336	0.3584	2.6051
70	0.9397	0.3420	2.7475
71	0.9455	0.3256	2.9042
72	0.9511	0.3090	3.0777
73	0.9563	0.2924	3.2709
74	0.9613	0.2756	3.4874
75	0.9659	0.2588	3.7321
76	0.9703	0.2419	4.0108
77	0.9744	0.2250	4.3315
78	0.9781	0.2079	4.7046
79	0.9816	0.1908	5.1446
80	0.9848	0.1736	5.6713
81	0.9877	0.1564	6.3138
82	0.9903	0.1392	7.1154
83	0.9925	0.1219	8.1443
84	0.9945	0.1045	9.5144
85	0.9962	0.0872	11.4301
86	0.9976	0.0698	14.3007
87	0.9986	0.0523	19.0811
88	0.9994	0.0349	28.6363
89	0.9998	0.0175	57.2900
90	1.0000	0.0000	∞

Chapter Two: Other Important and Interesting Ratios

The Golden Ratio

If you have followed along up until now, nice work! If you spent time trying to figure out each ratio on your own, it could have taken you a long time. If you are not too tired or worn out, I have one last problem I want to share with you.

Earlier this quarter, you learned about the legendary "Golden Ratio." I mentioned to you at the time that it was difficult to understand it fully without a solid foundation in ratio and proportion. We now have that foundation, so let us return.

The Golden Ratio is a ratio of the lengths in a line cut at a particular point, such that the whole is to the larger part as the larger part is to the smaller part. Picture a line cut into parts *a* and *b*, such that $(a + b) : a :: a : b$.

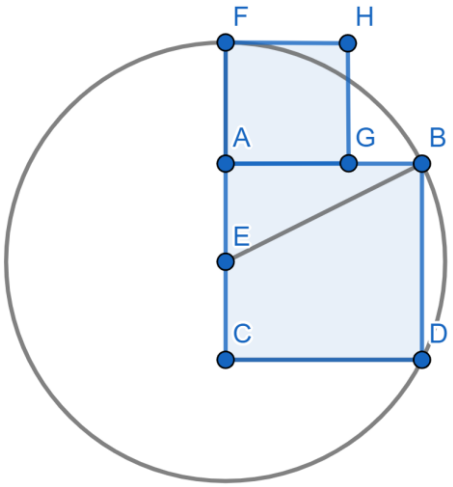
Each of these ratios, $(a + b) : a$ and $a : b$, are the Golden Ratio. As you can see, for any given line, there is only one place to cut it so that this proportion emerges. We used II.11 to find that very point.

Can you guess what's coming? If the Golden Ratio is always the same, can we find a specific number for it? For example, is it 2:1? Or 4:3? *What is the numerical representation of the Golden Ratio?*

We can easily see by a kind of guess-and-check method a lot of ratios that it is *not*. For example, 2:1 does not work because the proportion $(2 + 1) : 2 :: 2 : 1$ is clearly false. We see the same result for 4:3 and many other ratios we might be tempted to try.

Instead of guess-and-check, let's try a method similar to the one we used earlier. Let's look at a diagram—our construction of the Golden Ratio. Here, AB was the original line, and we cut it in the Golden Ratio at G, such that $AB : AG :: AG : GB$.

If we let AB = 1, find the ratio of AB:AG or AG:GB and you will know the numerical value of the Golden Ratio!



Just to refresh you on the construction,

1) square ABCD was built on AB
2) AC was bisected at E
3) Circle FBD was drawn with center E and radius EB
4) Square AFGH was built on AF.

Now, letting AB=1, find AB:AG.[6] Here is my recommendation about the order in which to proceed:

1) Find AC and then AE
2) Find EB
3) Find AF
4) Find AG
5) Write AB:AG as a ratio. This will be the Golden Ratio!

Give yourself some time to discover the ratio on your own. The solution is on the following page.

[6] I recommend finding AB:AG, rather than AG:GB, just to avoid some difficulty simplifying fractions later on.

Here is the solution:

1) Since AB = 1, AC must = 1 also, because ABCD is a square. Since AC was bisected, AE = $\frac{1}{2}$
2) Since AE= ½, and AB = 1, therefore EB = $\sqrt{\frac{5}{4}}$, which simplified is equal to $\frac{\sqrt{5}}{2}$
3) Since EB = $\frac{\sqrt{5}}{2}$, EF = $\frac{\sqrt{5}}{2}$ as well, because they are radii of the same circle FBD.
4) Since EF = $\frac{\sqrt{5}}{2}$, and AE = ½ , AF equals the difference between them: $\frac{\sqrt{5}}{2} - \frac{1}{2}$, or $\frac{\sqrt{5}-1}{2}$
5) Since AF = $\frac{\sqrt{5}-1}{2}$, and AF and AG are sides of the same square, AG = $\frac{\sqrt{5}-1}{2}$ as well.
6) Since AB = 1, and AG = $\frac{\sqrt{5}-1}{2}$, the Golden Ratio is $\frac{1}{\frac{\sqrt{5}-1}{2}}$.
7) Simplifying this,[7] we get $\frac{1+\sqrt{5}}{2}$. This is the numerical value of the Golden Ratio!

The Golden Ratio, thus, is an irrational number. The decimal approximation is ≈ 1.618033989. The symbol traditionally used to represent this number is φ (the Greek letter "phi").

The Fibonacci Series

The Golden Ratio has a very interesting connection to the Fibonacci Series. Essentially, the Fibonacci Series is a series of numbers, beginning with 0 and 1, and following a pattern in which the next term in the series is arrived at by adding the previous two terms. E.g. to get the 3rd term of the series, add 0 and 1.

$$\mathbf{0}, \mathbf{1}, \mathbf{1}, \mathbf{2}, \mathbf{3}, \mathbf{5}, \mathbf{8}, \mathbf{13}, \mathbf{21}, \mathbf{34}, \mathbf{55}, \mathbf{89}, \mathbf{144} \ldots$$

The Fibonacci Series, oddly enough, was first discovered as a model to represent reproduction patterns of rabbits, and then was subsequently discovered in more and more natural phenomena. For example, pinecones and nautilus shells follow a Fibonacci pattern of growth. Very mysterious!

Now, try taking any two numbers in the sequence, and take the latter in ratio to the former. For example, $5:3$, or $8:5$, or $55:34$. It turns out that, as you go further along in the pattern (moving out further and further to the right), the ratios get closer and closer to φ (the Golden Ratio). Try it yourself! If you divide any pair of adjacent numbers, the latter by the former, the number will get closer and closer to our decimal approximation: 1.618033989.

A mathematician eventually *proved* that, as the series goes to infinity, the ratio becomes equal to φ.

The Ratio of Circumference to Diameter

Another very important ratio is the ratio of the circumference to the diameter in a circle. It was noticed thousands of years ago that a circle's circumference was always about three times longer than its diameter: that is, the ratio of circumference to diameter was about 3:1. It has since been discovered that the ratio is irrational, and it is represented with the Greek letter "pi": that is, π. A decimal approximation of this ratio is ≈ 3.141592654. (That is, the circumference of every circle is roughly 3.14 times longer than its diameter. Thus, $C = \pi d$). How could you get a numerical value for π…? It's a great question but, unfortunately, we are out of time in this packet. Maybe another time!

---

[7] The simplification of this involves some tricky algebra. Multiply by $\frac{\frac{2}{\sqrt{5}-1}}{\frac{2}{\sqrt{5}-1}}$, and then by $\frac{1+\sqrt{5}}{1+\sqrt{5}}$ in order to eliminate the resulting radical in the denominator.

Congratulations! You are now officially done! Thank you again for your hard work this year. And now, as a little parting gift to you all, here is some ancient wisdom about the beauty and power of mathematics.

"[Mathematics is] the bridge that takes us from the senses and opinions to the mind and understanding, from the concrete and familiar objects to immaterial and eternal abstractions, from matter to soul."

- Nichomachus of Gerasa

Then, my noble friend, geometry will draw the soul towards truth, and create the spirit of philosophy.

- Plato

"The knowledge of which geometry aims is the knowledge of the eternal."

- Plato

"Those who assert that the mathematical sciences say nothing of the beautiful or the good are in error."

- Aristotle

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020

Course: Humane Letters 9

Teacher(s): Mr. McKowen (*robert.mckowen@greatheartsirving.org*)
Mr. Mercer (*andrew.mercer@greatheartsirving.org*)
Mrs. Hunt (*natalie.hunt@greatheartsirving.org*)

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26

Attend today's mandatory seminar to conclude our time together. The questions with longer explanations are in last week's packet. Here are the brief versions of questions for today.

1. How does what we have read this year, and what we have studied in history or government, reflect the enduring tension between living in common with others and finding personal happiness?
2. Looking at what we have read and studied, what is the fundamental nature of man?
3. To what extent are we continually affected by our past?

Wednesday, May 27- Friday May 29

1. Read "The Nature and Aim of Fiction" by Flannery O'Connor found at the end of this packet.
2. Questions to reflect on via writing in your notebook:

    a. What is a bold claim or sentence made by O'Connor that stood out to you? Clearly write it out. Why did it stand out to you?
    b. How is being a writer different from someone who is actively writing?
    c. What is the nature and aim of fiction?

3. Optional: Watch the Stratford Festival production of *The Tempest* and reflect on the following questions. The play is found on Google Classroom.

    a. What is the effect on the story of the director's decision to cast Prospero as a woman?
    b. What did you especially like about this production?
    c. What would you have done differently if you were directing *The Tempest?*

Books by FLANNERY O'CONNOR

Wise Blood

A Good Man Is Hard to Find

The Violent Bear It Away

Everything That Rises Must Converge

Mystery and Manners

The Complete Stories of Flannery O'Connor

The Habit of Being

Flannery O'Connor

MYSTERY AND MANNERS

Occasional Prose, selected & edited by

Sally and Robert Fitzgerald

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CONTENTS

The Nature and Aim of Fiction

I UNDERSTAND THAT THIS IS A COURSE CALLED "How the Writer Writes," and that each week you are exposed to a different writer who holds forth on the subject. The only parallel I can think of to this is having the zoo come to you, one animal at a time; and I suspect that what you hear one week from the giraffe is contradicted the next week by the baboon.

My own problem in thinking what I should say to you tonight has been how to interpret such a title as "How the Writer Writes." In the first place, there is no such thing as THE writer, and I think that if you

don't know that now, you should by the time such a course as this is over. In fact, I predict that it is the one thing you can be absolutely certain of learning.

But there is a widespread curiosity about writers and how they work, and when a writer talks on this subject, there are always misconceptions and mental rubble for him to clear away before he can even begin to see what he wants to talk about. I am not, of course, as innocent as I look. I know well enough that very few people who are supposedly interested in writing are interested in writing well. They are interested in publishing something, and if possible in making a "killing." They are interested in being a writer, not in writing. They are interested in seeing their names at the top of something printed, it matters not what. And they seem to feel that this can be accomplished by learning certain things about working habits and about markets and about what subjects are currently acceptable.

If this is what you are interested in, I am not going to be of much use to you. I feel that the external habits of the writer will be guided by his common sense or his lack of it and by his personal circumstances; and that these will seldom be alike in two cases. What interests the serious writer is not external habits but what Maritain calls, "the habit of art"; and he explains that "habit" in this sense means a certain

quality or virtue of the mind. The scientist has the habit of science; the artist, the habit of art.

Now I'd better stop here and explain how I'm using the word *art*. Art is a word that immediately scares people off, as being a little too grand. But all I mean by art is writing something that is valuable in itself and that works in itself. The basis of art is truth, both in matter and in mode. The person who aims after art in his work aims after truth, in an imaginative sense, no more and no less. St. Thomas said that the artist is concerned with the good of that which is made; and that will have to be the basis of my few words on the subject of fiction.

Now you'll see that this kind of approach eliminates many things from the discussion. It eliminates any concern with the motivation of the writer except as this finds its place inside the work. It also eliminates any concern with the reader in his market sense. It also eliminates that tedious controversy that always rages between people who declare that they write to express themselves and those who declare that they write to fill their pocketbooks, if possible.

In this connection I always think of Henry James. I know of no writer who was hotter after the dollar than James was, or who was more of a conscientious artist. It is true, I think, that these are times when the financial rewards for sorry writing are much greater

than those for good writing. There are certain cases in which, if you can only learn to write poorly enough, you can make a great deal of money. But it is not true that if you write well, you won't get published at all. It is true that if you want to write well and live well at the same time, you'd better arrange to inherit money or marry a stockbroker or a rich woman who can operate a typewriter. In any case, whether you write to make money or to express your soul or to insure civil rights or to irritate your grandmother will be a matter for you and your analyst, and the point of departure for this discussion will be the good of the written work.

The kind of written work I'm going to talk about is story-writing, because that's the only kind I know anything about. I'll call any length of fiction a story, whether it be a novel or a shorter piece, and I'll call anything a story in which specific characters and events influence each other to form a meaningful narrative. I find that most people know what a story is until they sit down to write one. Then they find themselves writing a sketch with an essay woven through it, or an essay with a sketch woven through it, or an editorial with a character in it, or a case history with a moral, or some other mongrel thing. When they realize that they aren't writing stories, they decide that the remedy for this is to learn something that

they refer to as the "technique of the short story" or "the technique of the novel." Technique in the minds of many is something rigid, something like a formula that you impose on the material; but in the best stories it is something organic, something that grows out of the material, and this being the case, it is different for every story of any account that has ever been written.

I think we have to begin thinking about stories at a much more fundamental level, so I want to talk about one quality of fiction which I think is its least common denominator—the fact that it is concrete—and about a few of the qualities that follow from this. We will be concerned in this with the reader in his fundamental human sense, because the nature of fiction is in large measure determined by the nature of our perceptive apparatus. The beginning of human knowledge is through the senses, and the fiction writer begins where human perception begins. He appeals through the senses, and you cannot appeal to the senses with abstractions. It is a good deal easier for most people to state an abstract idea than to describe and thus re-create some object that they actually see. But the world of the fiction writer is full of matter, and this is what the beginning fiction writers are very loath to create. They are concerned primarily with unfleshed ideas and emotions. They are apt to be re-

formers and to want to write because they are possessed not by a story but by the bare bones of some abstract notion. They are conscious of problems, not of people, of questions and issues, not of the texture of existence, of case histories and of everything that has a sociological smack, instead of with all those concrete details of life that make actual the mystery of our position on earth.

The Manicheans separated spirit and matter. To them all material things were evil. They sought pure spirit and tried to approach the infinite directly without any mediation of matter. This is also pretty much the modern spirit, and for the sensibility infected with it, fiction is hard if not impossible to write because fiction is so very much an incarnational art.

One of the most common and saddest spectacles is that of a person of really fine sensibility and acute psychological perception trying to write fiction by using these qualities alone. This type of writer will put down one intensely emotional or keenly perceptive sentence after the other, and the result will be complete dullness. The fact is that the materials of the fiction writer are the humblest. Fiction is about everything human and we are made out of dust, and if you scorn getting yourself dusty, then you shouldn't try to write fiction. It's not a grand enough job for you.

Now when the fiction writer finally gets this idea through his head and into his habits, he begins to realize what a job of heavy labor the writing of fiction is. A lady who writes, and whom I admire very much, wrote me that she had learned from Flaubert that it takes at least three activated sensuous strokes to make an object real; and she believes that this is connected with our having five senses. If you're deprived of any of them, you're in a bad way, but if you're deprived of more than two at once, you almost aren't present.

All the sentences in *Madame Bovary* could be examined with wonder, but there is one in particular that always stops me in admiration. Flaubert has just shown us Emma at the piano with Charles watching her. He says, "She struck the notes with aplomb and ran from top to bottom of the keyboard without a break. Thus shaken up, the old instrument, whose strings buzzed, could be heard at the other end of the village when the window was open, and often the bailiff's clerk, passing along the highroad, bareheaded and in list slippers, stopped to listen, his sheet of paper in his hand."

The more you look at a sentence like that, the more you can learn from it. At one end of it, we are with Emma and this very solid instrument "whose strings buzzed," and at the other end of it we are across the

village with this very concrete clerk in his lis sl:p-pers. With regard to what happens to Emma in the rest of the novel, we may think that it makes no difference that the instrument has buzzing strings or that the clerk wears list slippers and has a piece of paper in his hand, but Flaubert had to create a believable village to put Emma in. It's always necessary to remember that the fiction writer is much less *immediately* concerned with grand ideas and bristling emotions than he is with putting list slippers on clerks.

Now of course this is something that some people learn only to abuse. This is one reason that strict naturalism is a dead end in fiction. In a strictly naturalistic work the detail is there because it is natural to life, not because it is natural to the work. In a work of art we can be extremely literal, without being in the least naturalistic. Art is selective, and its truthfulness is the truthfulness of the essential that creates movement.

The novel works by a slower accumulation of detail than the short story does. The short story requires more drastic procedures than the novel because more has to be accomplished in less space. The details have to carry more immediate weight. In good fiction, certain of the details will tend to accumulate meaning from the story itself, and when this happens, they become symbolic in their action.

Now the word *symbol* scares a good many people off, just as the word *art* does. They seem to feel that a symbol is some mysterious thing put in arbitrarily by the writer to frighten the common reader—sort of a literary Masonic grip that is only for the initiated. They seem to think that it is a way of saying something that you aren't actually saying, and so if they can be got to read a reputedly symbolic work at all, they approach it as if it were a problem in algebra. Find x. And when they do find or think they find this abstraction, x, then they go off with an elaborate sense of satisfaction and the notion that they have "understood" the story. Many students confuse the *process* of understanding a thing with understanding it.

I think that for the fiction writer himself, symbols are something he uses simply as a matter of course. You might say that these are details that, while having their essential place in the literal level of the story, operate in depth as well as on the surface, increasing the story in every direction.

I think the way to read a book is always to see what happens, but in a good novel, more always happens than we are able to take in at once, more happens than meets the eye. The mind is led on by what it sees into the greater depths that the book's symbols naturally suggest. This is what is meant when critics say

that a novel operates on several levels. The truer the symbol, the deeper it leads you, the more meaning it opens up. To take an example from my own book, *Wise Blood*, the hero's rat-colored automobile is his pulpit and his coffin as well as something he thinks of as a means of escape. He is mistaken in thinking that it is a means of escape, of course, and does not really escape his predicament until the car is destroyed by the patrolman. The car is a kind of death-in-life symbol, as his blindness is a life-in-death symbol. The fact that these meanings are there makes the book significant. The reader may not see them but they have their effect on him nonetheless. This is the way the modern novelist sinks, or hides, his theme.

The kind of vision the fiction writer needs to have, or to develop, in order to increase the meaning of his story is called anagogical vision, and that is the kind of vision that is able to see different levels of reality in one image or one situation. The medieval commentators on Scripture found three kinds of meaning in the literal level of the sacred text: one they called allegorical, in which one fact pointed to another; one they called tropological, or moral, which had to do with what should be done; and one they called anagogical, which had to do with the Divine life and our participation in it. Although this was a method applied to biblical exegesis, it was also an attitude toward all of

creation, and a way of reading nature which included most possibilities, and I think it is this enlarged view of the human scene that the fiction writer has to cultivate if he is ever going to write stories that have any chance of becoming a permanent part of our literature. It seems to be a paradox that the larger and more complex the personal view, the easier it is to compress it into fiction.

People have a habit of saying, "What is the theme of your story?" and they expect you to give them a statement: "The theme of my story is the economic pressure of the machine on the middle class"—or some such absurdity. And when they've got a statement like that, they go off happy and feel it is no longer necessary to read the story.

Some people have the notion that you read the story and then climb out of it into the meaning, but for the fiction writer himself the whole story is the meaning, because it is an experience, not an abstraction.

Now the second common characteristic of fiction follows from this, and it is that fiction is presented in such a way that the reader has the sense that it is unfolding around him. This doesn't mean he has to identify himself with the character or feel compassion for the character or anything like that. It just means that fiction has to be largely presented rather than re-

ported. Another way to say it is that though fiction is a narrative art, it relies heavily on the element of drama.

The story is not as extreme a form of drama as the play, but if you know anything about the history of the novel, you know that the novel as an art form has developed in the direction of dramatic unity.

The major difference between the novel as written in the eighteenth century and the novel as we usually find it today is the disappearance from it of the author. Fielding, for example, was everywhere in his own work, calling the reader's attention to this point and that, directing him to give his special attention here or there, clarifying this and that incident for him so that he couldn't possibly miss the point. The Victorian novelists did this, too. They were always coming in, explaining and psychologizing about their characters. But along about the time of Henry James, the author began to tell his story in a different way. He began to let it come through the minds and eyes of the characters themselves, and he sat behind the scenes, apparently disinterested. By the time we get to James Joyce, the author is nowhere to be found in the book. The reader is on his own, floundering around in the thoughts of various unsavory characters. He finds himself in the middle of a world apparently without comment.

But it is from the kind of world the writer creates, from the kind of character and detail he invests it with, that a reader can find the intellectual meaning of a book. Once this is found, however, it cannot be drained off and used as a substitute for the book. As the late John Peale Bishop said: "You can't say Cézanne painted apples and a tablecloth and have said what Cézanne painted." The novelist makes his statements by selection, and if he is any good, he selects every word for a reason, every detail for a reason, every incident for a reason, and arranges them in a certain time-sequence for a reason. He demonstrates something that cannot possibly be demonstrated any other way than with a whole novel.

Art forms evolve until they reach their ultimate perfection, or until they reach some state of petrifaction, or until some new element is grafted on and a new art form made. But however the past of fiction has been or however the future will be, the present state of the case is that a piece of fiction must be very much a self-contained dramatic unit.

This means that it must carry its meaning inside it. It means that any abstractly expressed compassion or piety or morality in a piece of fiction is only a statement added to it. It means that you can't make an inadequate dramatic action complete by putting a statement of meaning on the end of it or in the middle of it

or at the beginning of it. It means that when you write fiction you are speaking *with* character and action, not *about* character and action. The writer's moral sense must coincide with his dramatic sense.

It's said that when Henry James received a manuscript that he didn't like, he would return it with the comment, "You have chosen a good subject and are treating it in a straightforward manner." This usually pleased the person getting the manuscript back, but it was the worst thing that James could think of to say, for he knew, better than anybody else, that the straightforward manner is seldom equal to the complications of the good subject. There may never be anything new to say, but there is always a new way to say it, and since, in art, the way of saying a thing becomes a part of what is said, every work of art is unique and requires fresh attention.

It's always wrong of course to say that you can't do this or you can't do that in fiction. You can do anything you can get away with, but nobody has ever gotten away with much.

I believe that it takes a rather different type of disposition to write novels than to write short stories, granted that both require fundamentally fictional talents. I have a friend who writes both, and she says that when she stops a novel to work on short stories, she feels as if she has just left a dark wood to be set

upon by wolves. The novel is a more diffused form and more suited to those who like to linger along the way; it also requires a more massive energy. For those of us who want to get the agony over in a hurry, the novel is a burden and a pain. But no matter which fictional form you are using, you are writing a story, and in a story something has to happen. A perception is not a story, and no amount of sensitivity can make a story-writer out of you if you just plain don't have a gift for telling a story.

But there's a certain grain of stupidity that the writer of fiction can hardly do without, and this is the quality of having to stare, of not getting the point at once. The longer you look at one object, the more of the world you see in it; and it's well to remember that the serious fiction writer always writes about the whole world, no matter how limited his particular scene. For him, the bomb that was dropped on Hiroshima affects life on the Oconee River, and there's not anything he can do about it.

People are always complaining that the modern novelist has no hope and that the picture he paints of the world is unbearable. The only answer to this is that people without hope do not write novels. Writing a novel is a terrible experience, during which the hair often falls out and the teeth decay. I'm always highly irritated by people who imply that writing fiction is

an escape from reality. It is a plunge into reality and it's very shocking to the system. If the novelist is not sustained by a hope of money, then he must be sustained by a hope of salvation, or he simply won't survive the ordeal.

People without hope not only don't write novels, but what is more to the point, they don't read them. They don't take long looks at anything, because they lack the courage. The way to despair is to refuse to have any kind of experience, and the novel, of course, is a way to have experience. The lady who only read books that improved her mind was taking a safe course—and a hopeless one. She'll never know whether her mind is improved or not, but should she ever, by some mistake, read a great novel, she'll know mighty well that something is happening to her.

A good many people have the notion that nothing happens in modern fiction and that nothing is supposed to happen, that it is the style now to write a story in which nothing happens. Actually, I think more happens in modern fiction—with less furor on the surface—than has ever happened in fiction before. A good example of this is a story by Caroline Gordon called "Summer Dust." It's in a collection of her stories called *The Forest of the South*, which is a book that repays study.

"Summer Dust" is divided into four short sections,

which don't at first appear to have any relation between them and which are minus any narrative connection. Reading the story is at first rather like standing a foot away from an impressionistic painting, then gradually moving back until it comes into focus. When you reach the right distance, you suddenly see that a world has been created—and a world in action —and that a complete story has been told, by a wonderful kind of understatement. It has been told more by showing what happens around the story than by touching directly on the story itself.

You may say that this requires such an intelligent and sophisticated reader that it is not worth writing, but I'm rather inclined to think that it is more a false sophistication that prevents people from understanding this kind of story than anything else. Without being naturalistic in the least, a story like "Summer Dust" is actually much closer in form to life than a story that follows a narrative sequence of events.

The type of mind that can understand good fiction is not necessarily the educated mind, but it is at all times the kind of mind that is willing to have its sense of mystery deepened by contact with reality, and its sense of reality deepened by contact with mystery. Fiction should be both canny and uncanny. In a good deal of popular criticism, there is the notion operating that all fiction has to be about the Average Man, and

has to depict average ordinary everyday life, that every fiction writer must produce what used to be called "a slice of life." But if life, in that sense, satisfied us, there would be no sense in producing literature at all.

Conrad said that his aim as a fiction writer was to render the highest possible justice to the visible universe. That sounds very grand, but it is really very humble. It means that he subjected himself at all times to the limitations that reality imposed, but that reality for him was not simply coextensive with the visible. He was interested in rendering justice to the visible universe because it suggested an invisible one, and he explained his own intentions as a novelist in this way:

> . . . and if the [artist's] conscience is clear, his answer to those who in the fullness of a wisdom which looks for immediate profit, demand specifically to be edified, consoled, amused; who demand to be promptly improved, or encouraged, or frightened, or shocked or charmed, must run thus: My task which I am trying to achieve is, by the power of the written word, to make you hear, to make you feel—it is, before all, to make you *see*. That—and no more, and it is everything. If I succeed, you shall find there, according to your deserts, encouragement, consolation, fear, charm, all you demand—and, perhaps, also that glimpse of truth for which you have forgotten to ask.

You may think from all I say that the reason I write is to make the reader see what I see, and that writing fiction is primarily a missionary activity. Let me straighten this out.

Last spring I talked here, and one of the girls asked me, "Miss O'Connor, why do you write?" and I said, "Because I'm good at it," and at once I felt a considerable disapproval in the atmosphere. I felt that this was not thought by the majority to be a high-minded answer; but it was the only answer I could give. I had not been asked why I write the way I do, but why I write at all; and to that question there is only one legitimate answer.

There is no excuse for anyone to write fiction for public consumption unless he has been called to do so by the presence of a gift. It is the nature of fiction not to be good for much unless it is good in itself.

A gift of any kind is a considerable responsibility. It is a mystery in itself, something gratuitous and wholly undeserved, something whose real uses will probably always be hidden from us. Usually the artist has to suffer certain deprivations in order to use his gift with integrity. Art is a virtue of the practical intellect, and the practice of any virtue demands a certain asceticism and a very definite leaving-behind of the niggardly part of the ego. The writer has to judge himself with a stranger's eye and a stranger's sever-

ity. The prophet in him has to see the freak. No art is sunk in the self, but rather, in art the self becomes self-forgetful in order to meet the demands of the thing seen and the thing being made.

I think it is usually some form of self-inflation that destroys the free use of a gift. This may be the pride of the reformer or the theorist, or it may only be that simple-minded self-appreciation which uses its own sincerity as a standard of truth. If you have read the very vocal writers from San Francisco, you may have got the impression that the first thing you must do in order to be an artist is to loose yourself from the bonds of reason, and thereafter, anything that rolls off the top of your head will be of great value. Anyone's unrestrained feelings are considered worth listening to because they are unrestrained and because they are feelings.

St. Thomas called art "reason in making." This is a very cold and very beautiful definition, and if it is unpopular today, this is because reason has lost ground among us. As grace and nature have been separated, so imagination and reason have been separated, and this always means an end to art. The artist uses his reason to discover an answering reason in everything he sees. For him, to be reasonable is to find, in the object, in the situation, in the sequence, the spirit which makes it itself. This is not an easy or

simple thing to do. It is to intrude upon the timeless, and that is only done by the violence of a single-minded respect for the truth.

It follows from all this that there is no technique that can be discovered and applied to make it possible for one to write. If you go to a school where there are classes in writing, these classes should not be to teach you how to write, but to teach you the limits and possibilities of words and the respect due them. One thing that is always with the writer—no matter how long he has written or how good he is—is the continuing process of learning how to write. As soon as the writer "learns to write," as soon as he knows what he is going to find, and discovers a way to say what he knew all along, or worse still, a way to say nothing, he is finished. If a writer is any good, what he makes will have its source in a realm much larger than that which his conscious mind can encompass and will always be a greater surprise to him than it can ever be to his reader.

I don't know which is worse—to have a bad teacher or no teacher at all. In any case, I believe the teacher's work should be largely negative. He can't put the gift into you, but if he finds it there, he can try to keep it from going in an obviously wrong direction. We can learn how not to write, but this is a discipline that does not simply concern writing itself but

concerns the whole intellectual life. A mind cleared of false emotion and false sentiment and egocentricity is going to have at least those roadblocks removed from its path. If you don't think cheaply, then there at least won't be the quality of cheapness in your writing, even though you may not be able to write well. The teacher can try to weed out what is positively bad, and this should be the aim of the whole college. Any discipline can help your writing: logic, mathematics, theology, and of course and particularly drawing. Anything that helps you to see, anything that makes you look. The writer should never be ashamed of staring. There is nothing that doesn't require his attention.

We hear a great deal of lamentation these days about writers having all taken themselves to the colleges and universities where they live decorously instead of going out and getting firsthand information about life. The fact is that anybody who has survived his childhood has enough information about life to last him the rest of his days. If you can't make something out of a little experience, you probably won't be able to make it out of a lot. The writer's business is to contemplate experience, not to be merged in it.

Everywhere I go I'm asked if I think the universities stifle writers. My opinion is that they don't stifle enough of them. There's many a best-seller that could

have been prevented by a good teacher. The idea of being a writer attracts a good many shiftless people, those who are merely burdened with poetic feelings or afflicted with sensibility. Granville Hicks, in a recent review of James Jones' novel, quoted Jones as saying, "I was stationed at Hickham Field in Hawaii when I stumbled upon the works of Thomas Wolfe, and his home life seemed so similar to my own, his feelings about himself so similar to mine about myself, that I realized I had been a writer all my life without knowing it or having written." Mr. Hicks goes on to say that Wolfe did a great deal of damage of this sort but that Jones is a particularly appalling example.

Now in every writing class you find people who care nothing about writing, because they think they are already writers by virtue of some experience they've had. It is a fact that if, either by nature or training, these people can learn to write badly enough, they can make a great deal of money, and in a way it seems a shame to deny them this opportunity; but then, unless the college is a trade school, it still has its responsibility to truth, and I believe myself that these people should be stifled with all deliberate speed.

Presuming that the people left have some degree of talent, the question is what can be done for them in a

writing class. I believe the teacher's work is largely negative, that it is largely a matter of saying "This doesn't work because . . ." or "This does work because . . ." The *because* is very important. The teacher can help you understand the nature of your medium, and he can guide you in your reading. I don't believe in classes where students criticize each other's manuscripts. Such criticism is generally composed in equal parts of ignorance, flattery, and spite. It's the blind leading the blind, and it can be dangerous. A teacher who tries to impose a way of writing on you can be dangerous too. Fortunately, most teachers I've known were too lazy to do this. In any case, you should beware of those who appear overenergetic.

In the last twenty years the colleges have been emphasizing creative writing to such an extent that you almost feel that any idiot with a nickel's worth of talent can emerge from a writing class able to write a competent story. In fact, so many people can now write competent stories that the short story as a medium is in danger of dying of competence. We want competence, but competence by itself is deadly. What is needed is the vision to go with it, and you do not get this from a writing class.

Writing Short Stories

I HAVE HEARD PEOPLE SAY THAT THE SHORT STORY was one of the most difficult literary forms, and I've always tried to decide why people feel this way about what seems to me to be one of the most natural and fundamental ways of human expression.* After all,

* In another mood on another occasion Flannery O'Connor began as follows: "I have very little to say about short-story writing. It's one thing to write short stories and another thing to talk about writing them, and I hope you realize that your asking me to talk about story-writing is just like asking a fish to lecture on swimming. The more stories I write, the more mysterious I find the process and the less I find myself capable of analyzing it. Before I started writing stories, I suppose I could have given you a pretty good lecture on the subject, but nothing produces silence like experience, and at this point I have very little to say about how stories are written."

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020
Course: Latin III
Teacher: Mr. John Bascom

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

My dear 9th Graders,

Our work for the year is nearly over. You will not be turning in anything for this week, so it is on your honor to attempt it. For your final week I give to you a challenge. Below are five passages taken from stories that you are most likely quite familiar with. None of these texts were originally written in Latin, but have been translated into Latin. Your challenge: first, see if you can discover what book the passage comes from; second, see if you can discover what is going on in the passage.

Finally, I bid you farewell. Thank you all for your excellent work this year, you were a joy to teach. I wish you well this summer and look forward to seeing you again next year.

Valete,

Mr. Bascom

Passage 1:
Nocte ballationis, pater, noverca, et filiae novercae ad ballationem profecti sunt. Cinerella, in foco sedens et lacrimans, repente magnam lucem vidit. Femina pulcherrima in media luce stabat. “Tua iuno sum. Cur lacrimas, Cinerella?” Cinerella feminae de ballatione narravit. “Sine difficultate,” clamavit tutrix, et vestes Cinerellae virga tetigit. Statim sordida stola evanuit, et pulchra nova stola apparuit! Et armillae et torquis et pulchri calcei vitrei apparuerunt!
…
Brevi Cinerella ad ballationem pervenit. Tam pulchra erat ut filius regis, eam videns, statim eam adamare inciperet. Filius regis alias puellas reliquit et cum Cinerella plurimam noctis ballabat.

Passage 2:

‘Heus, ecquis domi est?’

Fuit intus rumor quidam sternutamenti similis et deinde denuo silentium.

‘Dixi equidem et dico: ecquis domi est?’ clamavit Pu magna voce.

‘Minime,’ respondit vox; deinde subiunxit: ‘Noli tam magna voce clamare. Iam in primo te clarissime audivi.’

‘Malum!’ dixit Pu. ‘Nemo prorsus adest?’

‘Nemo!’

Winnue ille Pu caput foramine extraxit, aliquamdiu cogitabat et secum cogitabat: ‘Aliquis adesse debet quia aliquem “nemo” dixisse oportuit.’ Caput ergo iterum in foramen inseruit et dixit:

‘Heus, Lepus, esne tu?’

‘Non sum,’ dixit Lepus nunc mutata voce.

‘Nonne haec vox Leporem sonat?’

‘Non puto,’ dixit Lepus. ‘Nollem sonaret.’

‘O!’ dixit Pu.

Caput e foramine extraxit, aliquamdiu meditatus est, deinde caput iterum immisit et dixit:

‘Quaeso bona venia, dic mihi: ubi est Lepus?’

‘Abiit ad amicum suum Ursum Pum visendum, quia ille ei ex animo amicus est.’

‘Sed egomet sum ille!’ exclamavit Pu obstupefactus.

Passage 3:

et pastores erant in regione eadem vigilantes et custodientes vigilias noctis supra gregem suum
et ecce angelus Domini stetit iuxta illos
et claritas Dei circumfulsit illos et timuerunt timore magno
et dixit illis angelus
nolite timere
ecce enim evangelizo vobis vobis gaudium magnum quod erit omni populo
quia natus est vobis hodie salvator qui est Christus Dominus in civitate David
et hoc vobis signum
Invenietis infantem pannis involutum et positum in praesepio
et subito facta est cum angelo multitudo militiae caelestis
Laudantium Deum et dicentium
gloria in altissimis Deo
et in terra pax in hominibus bonae voluntatis

Passage 4:

“nunc est officium effractarii*,” nani Bilbonem significantes inquiunt. “tibi prodeundem est ad lucem comperiendam, quid ea significet, et num omnia omino tuta sint atque callida,” Thorinus hobbito inquit. “nunc exi atque cito redi, si omnia sit salva. si non, redi si potes! si non potes, bis cane similis tytoni* albaee atque semel similis megascopi*, tum quidcumque agere possimus, agemus.”

effractarius, -i : *burglar*
tyto, -onis alba : *barn owl*
megascops, -opis : *screech owl*

Passage 5:

crepitum arcus cursualis et sonitum epistularum in tapete calceis purgandis cadentium audiverunt.

‘afferto epistulas, Dudley,’ inquit Avunculus Vernon actis diurnis celatus.

‘iube Harrium eas afferre.’

‘afferto epistulas, Harri.’

‘iube Dudleum eas afferre.’

‘fodicato eum baculo isto scholastico, Dudley.’

Harrio, baculo scholastico eluso, epistulas petebat. in tapeti tres res iacebant: publici cursus chartula a Margareta sorore Avunculi Vernon ferias in insula Vecte agente missa et involucrum fusum in quo mercium venditarum ratio inesse videbatur et - *epistula ad Harrium missa.*

quam sublatam Harrius intuebatur, corde sonitum imitante ingentis catenae elasticae. nemo enim tota vita unquam ad eum scripserat. nesciebat autem quis scripturus esset. nullos amicos habebat, nullos praeter Dursleos propinquos - bibliothecae non adscriptus est, itaque ne libellos quidem impolitos acceperat librorum redditionem postulantes. haec epistula aderat tam claris litteris inscripta ut error non posset fieri:

Dominus H. Potter
Armarium sub Scalis
IV Gastatio Ligustrorum
Querela Parva
Comitatus Surreyiae

GreatHearts Irving

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020

Course: Music

Teacher(s): Mr. Zuno

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

This week,

1) Take a good look at this instrument reference chart. Once you have done this,
2) Listen to this piece of music by Debussy and name the instruments you can identify.
   Which colors represent these instruments?
   Which of the instruments on the chart did you hear in the performance?
3) As you can see, each instrument has a range of possible notes. Why is it important to know more specific information about ranges, such as detailed information about timbral characteristics?

4) Next, please listen to this music by Thomas Tallis. Using the chart below, keep in mind which voices are singing at any particular moment in the motet.


Soprano
Mezzo Soprano
Alto
Tenor
Baritone
Bass
E6
D6
C6
B5
A5
G5
F5
E5
D5
C5
B4
A4
G4
F4
E4
D4
C4
B3
A3
G3
F3
E3
D3
C3
B2
A2
G2
F2
E2

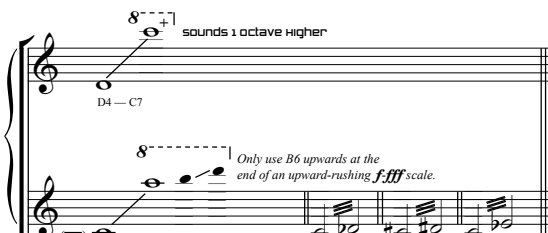
Instrument Ranges

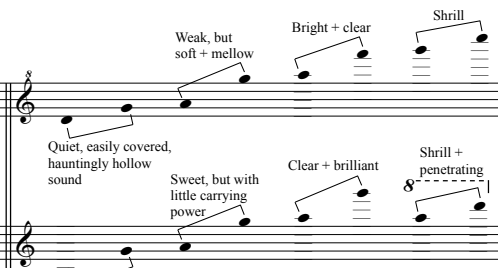
Timbral Characteristics

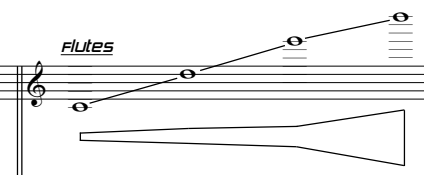
Dynamic Curves

Additional Comments

Piccolo

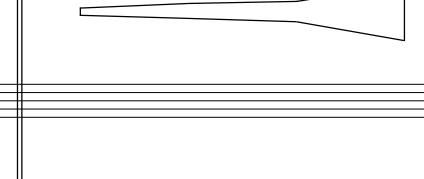






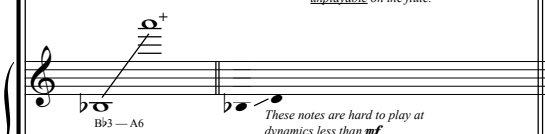
-More agile than flute
-Faster articulations
-Dynamic curve similar to flute but with exaggerated contrast
-Solo piccolo in mid+low registers - valuable voice
-High *piano* (***p***) - still shines through orchestral tutti

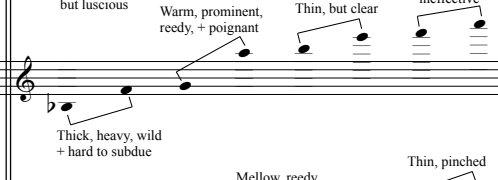
Flute

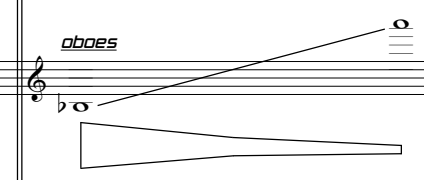


Flute
-Agile
-Fast articulations
-Rapid scales
-Intonation good except from G6 upwards: Also at this register, 2 flutes produce obvious beats which are more obvious with 4ths+5ths, less so with 3rds+6ths
-2+ = Increased mass, not volume
-Double, triple+flutter tonguing
-Wide leaps
-Easily masked below C5 (above mid C)

Oboe

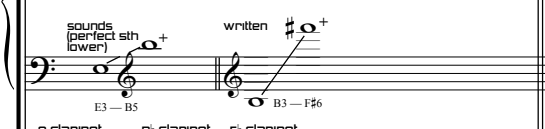


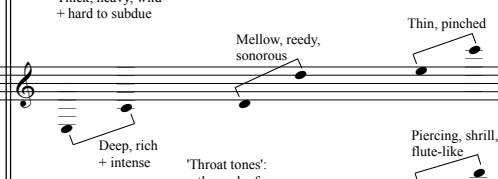




Oboe
-Agile
-Expressive
-Precise staccatos
-Rapid scales
-Vibrato - standard element
-Trills+ornaments sound clear
-All trills+tremolos possible (trems wider than perfect 4th are awkward)
-Smooth legato - even with wide leaps
-Double, triple tonguing. Flutter tonguing rare but possible

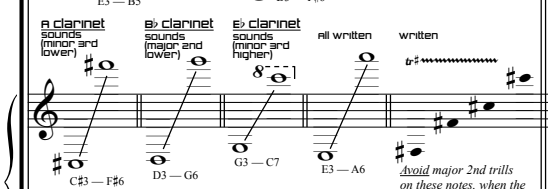
English Horn

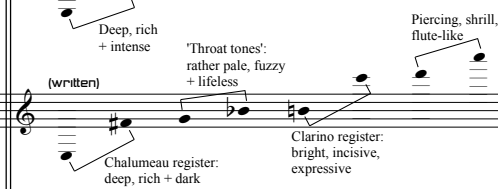


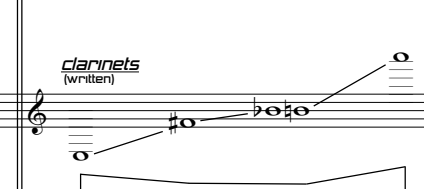


English Horn
-As agile as oboe
-More delicate and slightly quieter than oboe
-Precise attack
-Pointed staccatos
-Rich in upper partials

Clarinet

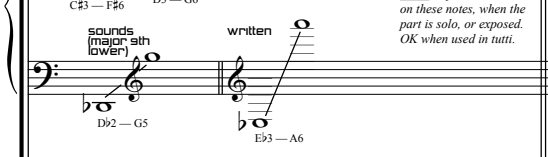


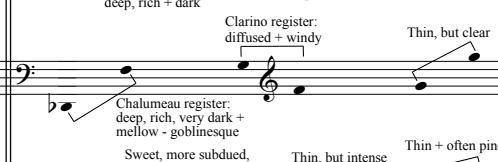




Clarinet
-Agile
-Smooth legatos
-Tremolos - good
-'E♭' more shrill without much chalumeau
-All major+minor 2nd trills possible (tricky ones listed opposite)
-No problem crossing break from B♭4-B4
-Staccato not as pointed as double reeds, so should be compensated for when used with oboes and/or bassoons
-Dynamic range greater than other woodwinds - all dynamics are available in all registers (attacks can be almost inaudible)

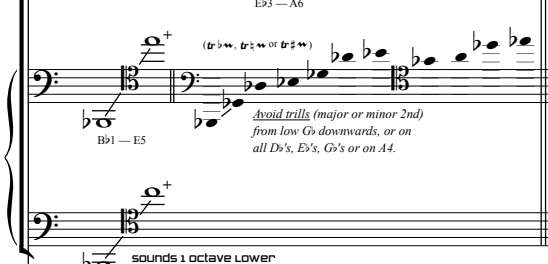
Bass Clarinet in B♭

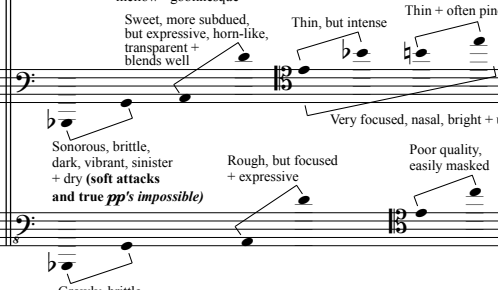


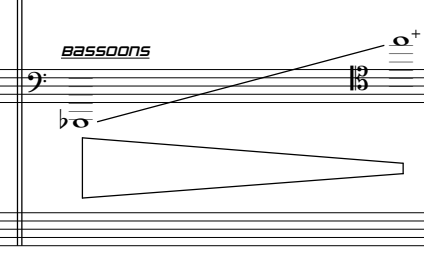


Bass Clarinet
-Agile - almost as much as clarinet
-Fluid
-Useful ensemble voice - gives clarity to cellos + d. basses
-Solo - distinguished + strikingly individual tone

Bassoon





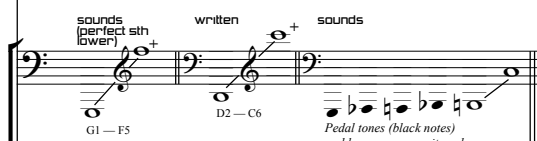


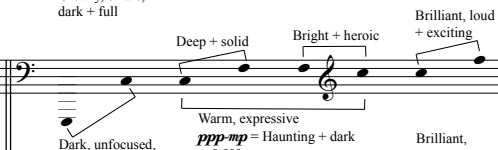
Bassoon
-Often doubles string melodies in unison, or in 8va below
-Agile - except lowest 5th and above G4:
-Rapid tonguing - single usual, but double + triple also possible
-Rapid loud or low passages need lots of breath
-Excellent as solo voice in upper range
-Divide tricky rapid passages below F2 between 2 bassoons
-Wide leaps

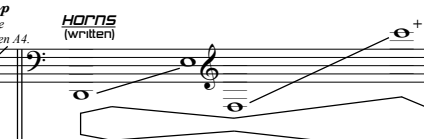
Double Bassoon

Double Bassoon
-Expressive
-Slightly less agile than bassoon, so make parts simpler
-Good bass to ***p-mf*** brass or woodwind ensemble
-Reedy and growly
-Adds unobtrusive pitch centre to low double basses
-Often doubles double basses in unison and doubles cellos in 8va below
-Well-focused

Horn in F

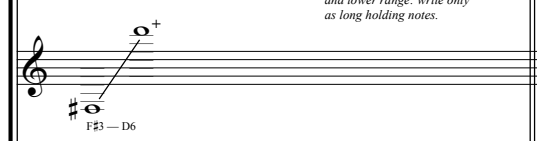


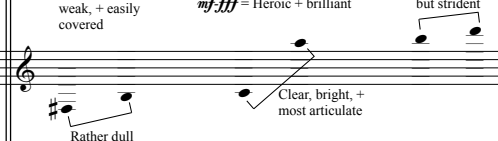


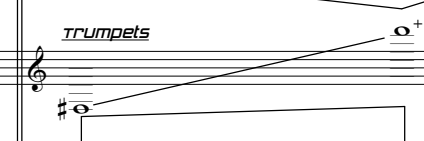


Horn -**Stopped notes**:Soft=Delicate, Loud=Ominous bite!
-Not very agile - leaps over 1 8ve should be used sparingly
-Tonguing is less incisive than other brasses, but pro players can perform double, triple and flutter tonguing
-**Trills**: i)Lip-commonest+smoothest type. Most whole-step lip trills above written B♭4, above mid C. are possible ii)Valve-Best are minor 2nds throughout whole range
-High notes lack accuracy+security, more so in soft passages

Trumpet in C

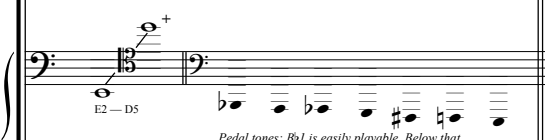


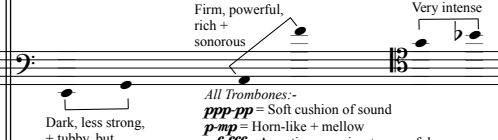




Trumpet
-Very agile - rapid passages, wide leaps
-Rapid tonguing easy - double, triple or flutter
-**Trills**: All major + minor 2nds possible
-**Tremolos**: minor 3rds+up are hard to play fast, but possible if both pitches require little or no change of fingering
-**Slurs**: All possible, but bigger than 1 8ve ascending and bigger than a 6th descending are difficult

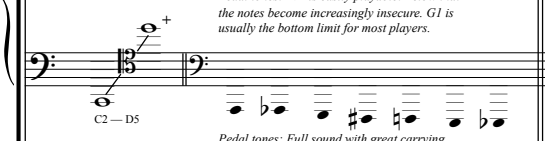
Tenor Trombone

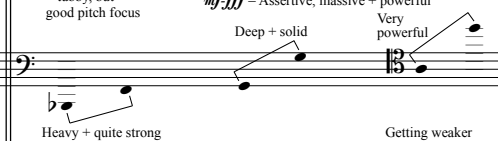




Tenor Trombone
-Responsive and flexible
-Agile from B♭3 upwards (less so below that):
-Rapid tonguing easy - double, triple or flutter
-Good balance with orchestra in any voicing
-Chords in open or close voicing - good
-Unison or 8ve doubling - good
-Sustained chords good, but not for too long above ***mf***
-Glissandi
-Legato tonguing used frequently
-Fast-moving passages are unidiomatic

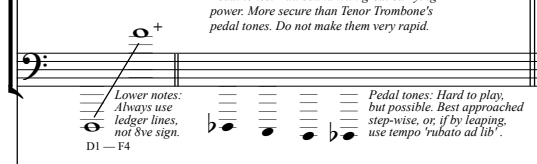
Bass Trombone

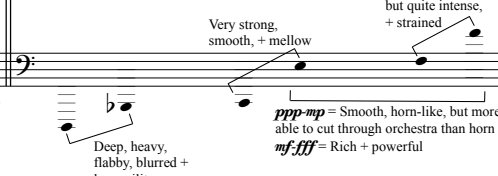


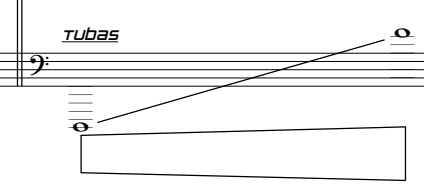


Bass Trombone
-Darker, more somber tone
-More secure lower range + pedal tones
-Requires more breathing spaces in music passages
-Glissandi

Tuba

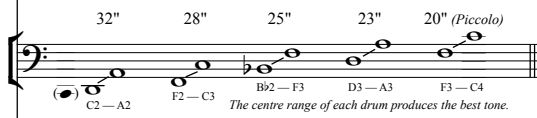






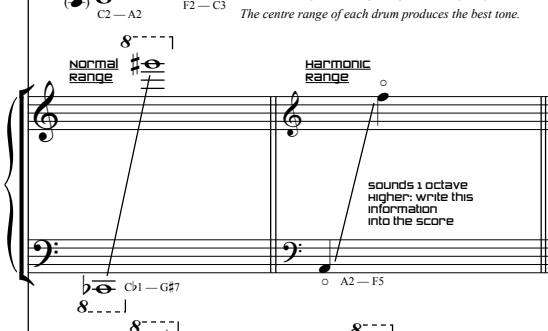
Tuba
-Agile
-Rapid tonguing - double, triple or flutter
-Requires lots of air, especially in lower register + at ***f-fff***
-Always use ledger lines for lower notes
-Uniform expressiveness throughout range
-Usually used as bass line, or doubles bass line 8ve lower
-Solo: Mellow + smooth

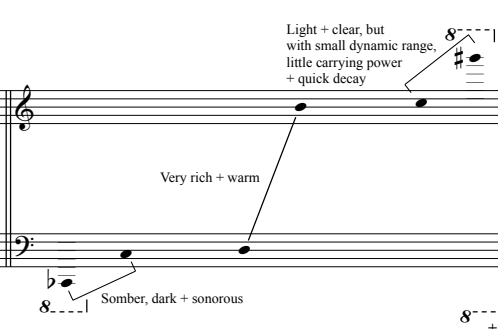
Timpani

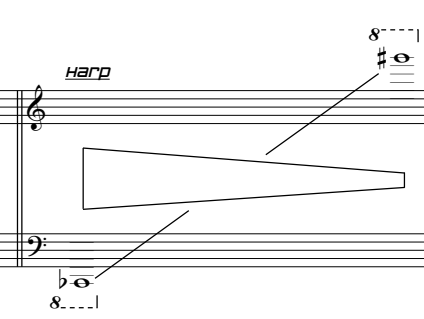


Timpani
-5 Ranges:The best tone is in the centre of each drum's range
-Each drum's lower range=Dull+thumpy, Upper=Hard+pingy
-Can be muffled with cloth
-Struck dead centre = Darker, more ominous - less ring
-Soft sticks = Warm, more resonant
Hard sticks = Louder + greater clarity
-Glissandi

Harp

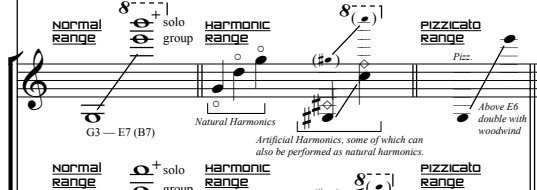






Harp -**Harmonics**: Left hand-up to 3 close harmonics (not over a 5th apart), right hand-only 1 harmonic. Must be all ♭, ♮, or ♯ per hand.
-47 strings, 7 pedals for each pitch class. Only 1 ♭, ♮, or ♯ tuning per string.
-All 8ves affected by changing 1 pitch class pedal, except the lowest 2 strings which have to be tuned manually
-Allow approximately 0.5-1 second per pedal change, which can be done while playing as long as that pitch is not played
-Only the left hand can reach lowest 8ve
-Chords of 4 or less notes per hand are possible
-Thumb+3 fingers used: So favour large intervals between upper pitches, and avoid large intervals between lower pitches
-Average hand span interval of 10th from thumb > ring finger
-**Tremolos**: Fast and loud tremolos possible, using 2 strings tuned to same note
-**Bisbiglando**: Delicate rustling trems at ***ppp*** - ***mp*** only + less clear articulation
-**Glissandi**: 1-handed, 2-handed, up, down or both, single notes or chord gliss. Can change the tuning in mid gliss.
-**Prés de la table**: Guitar-like, plucked near soundboard
-Flat ♭ strings resonate more than natural ♮ or sharp ♯ strings.
-**Sons Étouffés**: Dampen notes-dry stacc.

Violin



- uniform -

Violin
-Most agile, responsive + versatile of strings
-**Sul Tasto**: Bow over the fingerboard
-**Col Legno**: Tap string with wood of bow-hard, clattery sound (**ord.**=Bow with the hair of the bow)
-**Ponticello or Sul Ponticello**: Bow near bridge
-**Multiple stops**: i)Double:Adjacent strings, all dynamics, can sustain, easy to play ii)Triple: Only ***mf-fff***. If 2 open + 1 stopped string - easy iii)Quadruple: Only ***f-fff***
-Glissandi
-**Pizzicato**: Can play 2 at once

Viola

- dynamic -

Viola
-Good for doubling melodic lines at 8ve or in unison with violin
-Unison with English Horn = Rich + romantic
-Can reinforce + double cello, acting as a small cello
-Good used as the only bass part - solid, but not heavy foundation
-Usually divisi, not multiple stops, for 2, 3, or 4 pitches (but it can play multiple stops - same limitations of multiple stops as violin)
-Excellent used in or as accompaniment - rhythmic figurations, or harmonic structure
-Can be used as an inner voice
-**Solo**: mellow + mellancholy
-**Pizzicato**: More ring + body than violin
-Glissandi

Cello

- range -

Cello
-**Multiple stops**: i) Double: Adjacent strings, all dynamics, can sustain, easy to play. Avoid 2nds + 8ves unless 1 string is open. ii)Triple: Best at ***f-fff***. At ***mf*** or less the chord is broken.
-Avoid wide tremolos
-Agile, expressive, melodic, mellow+warm
-Can play complex+intricate lines
-**Bass lines**: Clear+focused. Subtle or aggressive
-Often scored above viola where it is very assertive
-Glissandi
-**Solo**: Comanding upper register. Also good in mid and lower lines
-**Pizzicato**: Good ringing quality + wide dynamics. Light, rapid. Pitch is well-focused
-**Pizz. Harmonics**: Also good and sustain well!
-**Harmonics**: Natural-up to the 12th partial - good
-**Ponticello**: Bow near bridge - very effective
-**Sul Tasto**: Bow over the fingerboard - very good

Double Bass

Double Bass
-Less agile than other strings
-**Double stops**: Best if 1 string is open
-Mid-upper range has a powerful intensity
-**Pizzicato**: Excellent, warm, full, sustaining. Good at ***ppp-fff***. They can provide the only necessary bass to a complex tonal structure!
-**Natural Harmonics**: Easy + good. They can provide an alternative to other string section tones because they are in the middle of the string section range.
-Try to avoid dividing basses in 8ves
-**Ponticello** (bowing near the bridge): } Both very
-**Sul Tasto** (bowing over the fingerboard): } effective!
-**Long pedal notes**: staggered in a group of d. basses due to the short bow (a solo player has to be skillful to avoid breaking long held notes)
-Glissandi

Bibliography

-Adler, Samuel
The Study of Orchestration
3rd ed. New York: Norton, 2002.

-Berlioz, Hector
Treatise on Instrumentation
Enl. and rev. Richard Strauss. Tran. Theodore Front.
New York: Dover, 1991.

-Blatter, Alfred
Instrumentation and Orchestration
2nd ed. New York, Schirmer Books, 1997.

-Forsyth, Cecil
Orchestration
2nd ed. New York: Dover, 1982.

-Jacob, Gordon
Orchestral Technique
3rd. ed. London and New York: Oxford University Press, 1982.

-Kennan, Kent and Grantham, Donald
Technique of Orchestration
6th ed. New Jersey: Prentice Hall, 2002.

-Rimsky-Korsakov, Nikolai
Principles of Orchestration
Ed. Maximilian Steinberg. Trans. Edward Agate.
New York: Dover, 1964.

-Piston, Walter
Orchestration
London: Victor Gollancz Ltd, 1955.

-Ray, Don B.
Orchestration Handbook
Milwaukee: Hal Leonard Corporation, 2000.

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020

Course: Physical Education

Teacher(s): John.Bascom@GreatHeartsIrving.org
Joseph.Turner@GreatHeartsIrving.org
James.Bascom@GreatHeartsIrving.org

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

Dearest students,

The year is coming to a close and the summer is almost upon us. For your final week of P.E., before the year officially ends, we want you to begin looking ahead to the summer and to begin setting goals and outlining routines that you would like to continue throughout the summer to stay active, healthy, and continue to grow and develop.

Think back to the goals that you set in week 1 of remote learning, think over what you have learned through attempting to carry out these routines, think about the workouts that we have given you each week. With all this in mind, write down on a piece of paper a revised list of goals and a revised weekly schedule. These are your goals and this is your schedule, they can be exactly the same or completely different as your previous goals/schedule. Feel free to aim high or to keep your goals/schedule very simple and manageable. Be sure to consider how much or how little you wish to do and then consider what the consequences of your choices will be.

Once you have written down your goals and your schedule, find a prominent place to post this schedule, maybe above your desk or on the back of your bedroom door. Put it in a place where you will see it frequently.

Your coaches wish for you a joyful summer and we look forward to seeing you again in the fall.

Stay savage.

Mr. John Bascom
Mr. James Bascom
Mr. Joseph Turner

Remote Learning Packet

There is no need to submit this packet at the end of the week. Enjoy your summer break!

Week 9: May 25-29, 2020

Course: Spanish I

Teacher(s): Ms. Barrera anna.barrera@greatheartsirving.org

Monday, May 25

Happy Memorial Day! No School!

Tuesday, May 26 - Friday May 29

I. Handouts: Famous Names in Spanish America: Read about explorers, National heroes, Writers, Painters, Composers and Musicians. Then do Exercises A through E.

II. Handouts: Places of Interest in Spanish America: Read about places in Mexico, South America, and then answer exercises A through D.

3. FAMOUS NAMES IN SPANISH AMERICA

A. Discoverers and Explorers

1. Cristóbal **Colón** (Christopher Columbus). Discovered the New World in 1492. Made four voyages, touching various parts of Spanish America.
2. Hernán **Cortés.** Conquered México, defeating the Aztecs and their king, Montezuma.
3. Francisco **Pizarro.** Conquered Perú and founded the city of Lima.
4. Juan **Ponce de León.** Discovered Florida (1513). He named it *la Florida* because it was discovered at Easter (*la Pascua Florida*).
5. Álvar Núñez **Cabeza de Vaca.** Explored much of the southern coastal area of what is now the United States, from Florida to Texas, walking thousands of miles. During six years of wandering, he lived for a time as a slave and medicine man to the Indians.
6. Francisco Vásquez de **Coronado.** Explored the southwestern part of what is now the United States (1542), searching for the rich "Seven Cities of Cíbola." He discovered the Grand Canyon (Arizona).
7. Hernando **de Soto.** Discovered the Mississippi River (1541).
8. Vasco Núñez de **Balboa.** Discovered the Pacific Ocean.

B. National Heroes

1. Simón **Bolívar** (1783–1830). The principal figure in the fight for South American independence from Spain. He won independence for the northern part of South America. Was called "el Libertador" (the Liberator). Bolivia was named in his honor.
2. José de **San Martín** (1778–1850). An Argentine general who won independence for the southern part of South America.
3. Bernardo **O'Higgins** (1778–1842). A Chilean general who helped San Martín in the liberation of Chile. He became the first president of Chile.
4. Antonio José de **Sucre** (1795–1830). Defeated the Spanish army in the battle of Ayacucho (Perú), the last battle of the revolution (1824).
5. Miguel **Hidalgo** (1753–1811). A Mexican priest and patriot who began the struggle for Mexican independence (1810).
6. Benito **Juárez** (1806–1872). Fought to free México from Maximilian. He was called the "Abraham Lincoln of México."
7. José **Martí** (1853–1895). A famous Cuban poet and patriot who died fighting for Cuban independence from Spain.

C. Writers

1. Andrés **Bello** (1781–1865). Poet, critic, and a leading intellectual of Spanish America. Wrote *Gramática de la lengua castellana.*
2. Domingo Faustino **Sarmiento** (1811–1888). An Argentine educator and statesman. Was known as the "Schoolmaster President." He wrote *Facundo*, which deals with the life of a gaucho leader.
3. Ricardo **Palma** (1833–1919). Wrote *Tradiciones peruanas*, a collection of stories about life in Perú during colonial times.
4. Rubén **Darío** (1867–1916). Was born in Nicaragua. He was the greatest poet of Spanish America. He introduced a new poetic style called "modernism."

5. Mariano **Azuela** (1873–1952). A Mexican novelist who wrote *Los de abajo*, a novel of the Mexican revolution of 1910–1920.
6. Gabriela **Mistral** (1889–1957) and Pablo **Neruda** (1904–1973). Chilean poets who won the Nobel Prize for Literature in 1945 and 1971, respectively.
7. Rómulo **Gallegos** (1884–1969). A Venezuelan novelist and statesman. He wrote *Doña Bárbara*, a novel of life on the plains of Venezuela.
8. Octavio **Paz** (1914–). Mexican poet and essayist. He won the Nobel Prize for Literature in 1990.
9. Gabriel **García Márquez** (1928–). A Colombian novelist who wrote *Cien años de soledad*, the history of an imaginary town in Colombia. He received the Nobel Prize for Literature in 1982.

D. Painters

1. Diego **Rivera,** José **Orozco,** and David **Siqueiros** are the three most important painters of México. All three specialized in mural painting, and all treated political and social topics.
2. Bernaldo de **Quirós,** of Argentina, painted scenes of gaucho life.

E. Composers and Musicians

1. Carlos **Chávez** (1899–1978), a famous Mexican composer and orchestra conductor.
2. Claudio **Arrau** was a famous Chilean pianist.

EXERCISES

A. Identify each of the following as:

a. explorer *b.* writer *c.* painter *d.* composer-musician *e.* national hero

------- **1.** Mariano Azuela
------- **2.** Francisco Pizarro
------- **3.** Álvar Núñez Cabeza de Vaca
------- **4.** Diego Rivera
------- **5.** Andrés Bello
------- **6.** Vasco Núñez de Balboa
------- **7.** Bernardo O'Higgins
------- **8.** Hernando de Soto
------- **9.** Rubén Darío
------- **10.** Carlos Chávez
------- **11.** Rómulo Gallegos
------- **12.** Claudio Arrau
------- **13.** Antonio José de Sucre
------- **14.** Bernaldo de Quirós
------- **15.** Benito Juárez

B. To the left of each item in column *A*, write the letter of the matching item in column *B*.

A		*B*
------- **1.** Ponce de León	------- **6.** Coronado	*a.* novelist
------- **2.** Sarmiento	------- **7.** Orozco	*b.* Seven Cities of Cíbola
------- **3.** San Martín	------- **8.** Palma	*c.* *Tradiciones peruanas*
------- **4.** Martí	------- **9.** Bolívar	*d.* Schoolmaster President
------- **5.** García Márquez	------- **10.** Cortés	*e.* Montezuma
		f. Florida
		g. painter
		h. Argentine independence
		i. Cuban patriot
		j. "the Liberator"

C. Underline the name, title, or word that correctly completes each statement.

1. (Siqueiros, Pizarro, Columbus) discovered the New World.
2. (Juárez, Hidalgo, San Martín) was called the "Abraham Lincoln of México."
3. The greatest poet of Spanish America was (Ricardo Palma, Rubén Darío, Rómulo Gallegos).
4. (*Doña Bárbara, Facundo, Los de abajo*) is a novel of the Mexican revolution.
5. (Claudio Arrau, Bernardo O'Higgins, Gabriela Mistral) was a famous Chilean pianist.
6. Diego Rivera was a famous (musician, novelist, painter).
7. The last battle in the struggle for South American independence took place at (Lima, Ayacucho, México).
8. (Gabriela Mistral, José Martí, Andrés Bello) won the Nobel Prize for Literature.
9. The first president of Chile was (Sucre, O'Higgins, Azuela).
10. Sarmiento wrote (*Facundo, Gramática de la lengua castellana, Tradiciones peruanas*).

D. 1. Write the name of a (an, the) . . .

a. city founded by Pizarro _____.
b. Mexican painter _____
c. Argentine educator _____
d. Spanish-American novelist _____
e. Spanish-American poet _____
f. conqueror of México _____
g. country named for Bolívar _____
h. Mexican composer _____
i. discoverer of the Mississippi River _____
j. discoverer of Florida _____

2. Who wrote . . .?

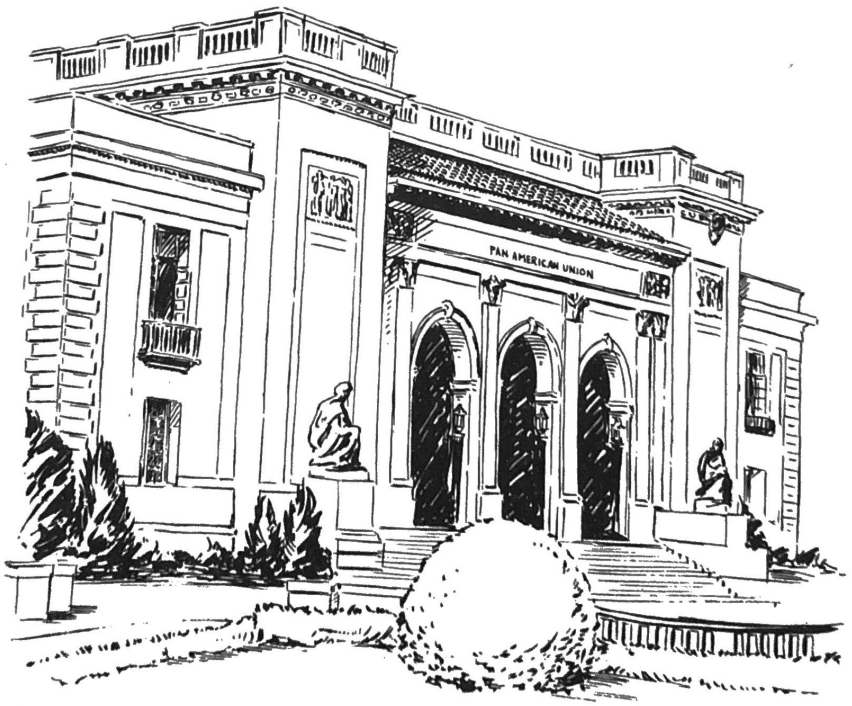
a. Facundo _____
b. Doña Bárbara _____
c. Tradiciones peruanas _____
d. Los de abajo _____
e. Cien años de soledad _____

E. Complete the following statements:

1. Montezuma was king of the _____.
2. *Doña Bárbara* was written by _____.
3. San Martín won independence for Chile and _____.
4. Bernaldo de Quirós painted scenes of the life of the _____.
5. The Mexican movement for independence from Spain was begun by _____

_____.

6. Columbus made _____ voyages to the New World.
7. The Spanish army was defeated by Sucre at the battle of _____.
8. José Orozco was a Mexican _____.
9. José Martí was killed in the war for the independence of _____.
10. _____ discovered the Mississippi River.



The Pan-American Union building in Washington, D.C., is the permanent headquarters of the Organization of American States. This magnificent marble structure has sometimes been called the "House of the Americas." Flags of the twenty-one American Republics and busts of their heroes are displayed in the central hall. One of the attractions of this building is its tropical patio in which are found brilliantly colored birds and exotic plants from all the American nations.

4. PLACES OF INTEREST IN SPANISH AMERICA

A. Interesting Places in México

1. **México City.** The capital of México. It was the old capital (*Tenochtitlán*) of the Aztec Indians. Today it is a large and modern city, the largest Spanish-speaking city in the world.
   a. **Cathedral of México:** The largest and oldest cathedral on the North American continent.
   b. **Piedra del Sol** (Stone of the Sun): An ancient stone inscribed with the Aztec calendar.
   c. **Chapultepec:** A large, beautiful park; contains a beautiful castle.
   d. **Palacio de Bellas Artes** (Palace of Fine Arts): Contains a beautiful theater and art museum.
   e. **University City:** The site of the National University, the oldest university of the North American continent.
   f. **Popocatépetl** and **Ixtaccíhuatl:** Picturesque volcanoes overlooking México City.
   g. **Xochimilco:** Town near México City, famous for its floating gardens.
2. **Taxco.** The most picturesque city in México. The Spanish colonial atmosphere is still preserved.
3. **Acapulco.** A fashionable seaside resort on the west coast.
4. **Guadalajara.** The second largest city in México. It is an important industrial city.

B. Interesting Places in South America

1. **Buenos Aires** (Argentina). One of the most beautiful capitals in the world.
2. **Lima** (Perú). The capital and main industrial and cultural center of Perú. The **University of San Marcos,** the oldest university in South America, is located here.
3. **Cuzco** (Perú). The ancient capital of the Inca civilization. Nearby are the famous Inca ruins of **Machu-Picchu.**
4. **Valparaíso** (Chile). The largest seaport on the entire west coast of South America.
5. **Bogotá** (Colombia). The capital and most important cultural center of Colombia. It has many excellent examples of colonial architecture.
6. **Quito** (Ecuador). Is located a few miles from the equator, but has a pleasant climate, due to its great altitude (nearly 10,000 feet). There are many excellent examples of colonial architecture.
7. **Lake Titicaca.** In the Andes Mountains, between Bolivia and Perú. It is the highest navigable lake in the world.
8. **Iguazú Falls.** Spectacular waterfall between Argentina and Brazil; higher than Niagara Falls.
9. **Cristo de los Andes.** A giant statue of Christ located in the Andes Mountains, on the border between Chile and Argentina. It was erected to commemorate the peaceful settlement of a boundary dispute.
10. **Viña del Mar** (Chile). A famous seaside resort. It has excellent beaches and casinos.

EXERCISES

A. To the left of each item in column *A*, write the letter of the matching item in column *B*.

A	*B*
_____ **1.** Valparaíso	*a.* floating gardens
_____ **2.** Tenochtitlán	*b.* seaside resort
_____ **3.** Cristo de los Andes	*c.* second largest city in México
_____ **4.** Popocatépetl	*d.* statue
_____ **5.** Cuzco	*e.* important Chilean seaport
_____ **6.** Iguazú	*f.* Aztec capital
_____ **7.** Xochimilco	*g.* lake
_____ **8.** Viña del Mar	*h.* volcano in México
_____ **9.** Titicaca	*i.* Inca capital
_____ **10.** Guadalajara	*j.* waterfall

B. ¿Sí o No? If the statement is true, write **sí;** if it is false, correct it by changing the words in italics, writing the correct words in the blank.

1. The *Piedra del Sol* is a famous theater in México. _____

2. The city of *Quito* is located near the equator. _____

3. The University of San Marcos is located in *Perú.* _____

4. Bogotá is the capital of *Colombia.* _____

5. Taxco is a picturesque city in *Argentina.* _____

6. *Acapulco* is a famous beach in México. _____

7. *The "Christ of the Andes"* is located between Bolivia and Perú. _____

8. The largest Spanish-speaking city in the world is *Buenos Aires.* _____

9. The oldest university in North America is located in *México.* _____

10. The ruins of Machu-Picchu are located near *Cuzco.* _____

C. Complete the following statements:

1. The volcanoes Popocatépetl and Ixtaccíhuatl are located near _____.

2. The highest navigable lake in the world is _____.

3. The oldest university of South America is located in _____.

4. "Christ of the Andes" commemorates the settlement of a dispute between Argentina and _____.

5. The largest seaport on the west coast of South America is _____.

6. The second largest city in México is _____.

7. Quito has a pleasant climate because of its _____.
8. Between Brazil and Argentina there is a waterfall called _____.
9. Viña del Mar is a seaside resort in _____.
10. Cuzco was the ancient capital of the _____.

D. Identify each of the following in an English sentence:

1. Palacio de Bellas Artes _____
2. Ixtaccíhuatl _____
3. Viña del Mar _____
4. Chapultepec _____
5. Guadalajara _____
6. Titicaca _____
7. Buenos Aires _____
8. Piedra del Sol _____
9. Xochimilco _____
10. Cathedral of México _____

General Francisco Franco led the Nationalist forces against the Republican government during the Spanish Civil War (1936–1939). This bitter struggle attracted thousands of volunteers from other nations, who came to fight for one side or the other. After the overthrow of the Republic in 1939, Franco became dictator of Spain, and ruled the country till his death in 1975.