



PLANNED INSTRUCTION LESSON MATERIALS

7th Grade

DUE DATE: FRIDAY, MAY 29TH

Please complete the following materials by the due date noted above.

Completed materials may be dropped off at the school (1006 West 10th Street) during food distribution Tuesdays and Fridays from 10:00am – 12:00noon, or turned in when the next week's materials are delivered to your home.

If you need assistance in completing the attached materials, please reach out to your classroom teacher via email, the school's website or Facebook page, or Class Dojo. You may also call the school directly Monday – Friday from 9:30-5:30 at 814-520-6468

Mrs. Veronica Will, Principal 814 873-5158

Mr. Aubrey Favors, Interim CEO 814 812-3026

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The decision whether to allow slavery in new territories was a heated issue that divided the nation.

Political Conflict Over Slavery

What political compromises were made because of slavery?

The question of slavery had long fueled debate in the United States. Each time this debate flared, the nation's leaders struck some form of compromise.

For example, in 1820 the Missouri Compromise preserved the balance between slave and free states in the Senate. It also brought about a temporary stop in the debate over slavery.

New Territory Brings New Debates

In the 1840s, the debate over slavery in new territories erupted again. In 1844 the Democrats nominated James K. Polk of Tennessee for president and called for the annexation of Texas at the earliest possible time. After Polk's election, Texas was admitted to the Union in December 1845.

Texas's entry into the Union angered the Mexican government. Matters worsened when the two countries disputed the boundary between Texas and Mexico. At the same time, support was growing in the South for taking over California and New Mexico. President Polk tried to buy these territories from the Mexican government, but failed. All these issues helped lead to the Mexican War.

Differing Views

Soon after the war with Mexico began, Representative David Wilmot of Pennsylvania introduced the Wilmot Proviso. This proposal would ban slavery in any lands the United States might acquire from Mexico.

Southerners protested. They wanted the new territory to remain open to slavery. Senator John C. Calhoun of South Carolina offered another idea, saying that neither Congress nor any territorial government could ban slavery from a territory or **regulate** it.

Neither bill passed, but both caused heated debate. By the 1848 presidential election, the United States had taken California and New Mexico from Mexico but took no action on slavery in those territories.

In 1848 the Whigs picked General Zachary Taylor as their presidential candidate. The Democrats chose Senator Lewis Cass of Michigan. Both candidates ignored the slavery issue, which angered some voters.

Those who opposed slavery left their parties and formed the Free-Soil Party. Its slogan was "Free Soil, Free Speech, Free Labor, and Free Men." The party chose former president Martin Van Buren as its candidate. Taylor won, but the Free-Soil Party gained several seats in Congress.

A New Compromise

Concerned over growing abolitionism, Southerners wanted a strong national **fugitive** (FYOO • juh • tiv), or runaway, slave law. Such a law would require every state to return runaway slaves.

In 1849 California applied to become a state—without slavery. If California became a free state, however, slave states would be outvoted in the Senate. Also, antislavery groups wanted to ban slavery in Washington, D.C. Southerners talked about **seceding** (seh • SEED • ihng) from, or leaving, the Union.

In 1850 Senator Henry Clay of Kentucky suggested a compromise. California would be a free state, but other new territories would have no limits on slavery. In addition, the slave trade, but not slavery itself, would be illegal in Washington, D.C. Clay also pushed for a stronger fugitive slave law.

A heated debate took place in Congress. Senator Calhoun opposed Clay's plan. Senator Daniel Webster supported it. Then President Taylor, who was against Clay's plan, died unexpectedly. Vice President Millard Fillmore, who favored the plan, became president.

Senator Stephen A. Douglas of Illinois solved the problem. He divided Clay's plan into parts, each to be voted on separately. Fillmore had several Whigs abstain, or not vote, on the parts they opposed. In the end, Congress passed the Compromise of 1850.

The Fugitive Slave Act

Part of the Compromise of 1850 was the Fugitive Slave Act. Anyone who helped a fugitive could be fined or imprisoned. Some Northerners refused to obey the new law. In his 1849 essay "Civil Disobedience," Henry David Thoreau wrote that if the law "requires you to be the agent [cause] of injustice to another, then I say, break the law." Northern juries refused to convict people accused of breaking the new law. People gave money to buy freedom for enslaved people. Free African Americans and whites formed a network, or interconnected system, called the Underground Railroad to help runaways find their way to freedom. Democrat Franklin Pierce became president in 1853. He intended to enforce the Fugitive Slave Act.

Explaining Who formed the Free-Soil Party and why?

The Kansas-Nebraska Act

What is the Kansas-Nebraska Act?

In 1854 Senator Stephen A. Douglas of Illinois introduced a bill to settle the issue of slavery in the territories. It organized the region west of Missouri and Iowa as the territories of Kansas and Nebraska. Both were north of 36°30' N latitude, the line that limited slavery. Before the law they would have been free, giving the free states more votes in the Senate and angering the South.

Douglas hoped to make his plan acceptable to both the North and South. He proposed repealing the Missouri Compromise and letting the voters in each territory vote on whether to allow slavery. He called his proposal "popular sovereignty."

This idea, which is central to the American system of government, means that the people are the source of all government power. Douglas's *popular sovereignty* came to mean a particular method for deciding the question of slavery in a place.

Northerners protested. The plan allowed slavery in areas that had been free for years. Southerners supported the bill. They expected Kansas to be settled mostly by slaveholders from Missouri. They would, of course, vote to keep slavery legal. With some support from Northern Democrats and the backing of President Pierce, the Kansas-Nebraska Act passed in 1854.

Conflict in Kansas

Supporters of both sides rushed to Kansas. Armed pro-slavery supporters known as **border ruffians** (BOHR • duhr RUH • fee • uhns) crossed the border from Missouri just to vote. When elections took place, only about 1,500 voters lived in Kansas, but more than 6,000 people voted. The pro-slavery group won.

Kansas established laws supporting slavery. Slavery opponents refused to accept the laws. They armed themselves, held their own elections, and adopted a constitution banning slavery. By January 1856, Kansas had two rival governments.

In May 1856, slavery supporters attacked the town of Lawrence, an antislavery stronghold. Antislavery forces retaliated. John Brown led an attack that killed five supporters of slavery. Newspapers wrote about "Bleeding Kansas" and "the Civil War in Kansas." A **civil war** is war between citizens of the same country. In October 1856, federal troops arrived to stop the bloodshed.

Identifying Cause and Effect What events led to "Bleeding Kansas"?

LESSON 1 REVIEW

Review Vocabulary

1. Explain the significance of the following terms.
a. fugitive b. secede

2. Use the following terms in a short paragraph about Kansas in the 1850s.
a. border ruffians b. civil war

Answer the Guiding Questions

3. **Describing** How did the Compromise of 1850 address the question of slavery?

4. **Analyzing** What was the Wilmot Proviso? Why was it so controversial?

5. **Explaining** How did Stephen Douglas help win approval of the Compromise of 1850?

6. Listing What were some ways that Northerners defied the Fugitive Slave Act?

7. ARGUMENT Write a dialogue between two people in Nebraska who are expressing their views on the issue of popular sovereignty. Have one person defend the policy and the other oppose it.

Name:

Directions: Define the following terms twice.

1. **Fugitive**

a.

b.

2. **Secede**

a.

b.

3. **border ruffian**

a.

b.

4. **civil war**

a.

b.

5. **Regulate**

a.

b.

6. **Network**

a.

b.

Chapter 16-1 Quiz

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What is your name? *

Your answer

Name used in 1856 newspaper stories about events in Lawrence, Kansas * 1 point

- 36 30 North Latitude
- "Bleeding Kansas"
- John Brown
- Compromise of 1850
- Kansas-Nebraska Act

Put the issue of slavery to popular vote * 1 point

- 36 30 North Latitude
- "Bleeding Kansas"
- John Brown
- Compromise of 1850
- Kansas-Nebraska Act



included the Fugitive Slave Act *

1 point

- 36 30 North Latitude
- "Bleeding Kansas"
- John Brown
- Compromise of 1850
- Kansas-Nebraska Act

the line that marked the division between slave states and non slave states

1 point

*

- 36 30 North Latitude
- "Bleeding Kansas"
- John Brown
- Compromise of 1850
- Kansas-Nebraska Act

violent abolitionist *

1 point

- 36 30 North Latitude
- "Bleeding Kansas"
- John Brown
- Compromise of 1850
- Kansas-Nebraska Act



The Wilmot Proviso called for *

1 point

- the election of Martin Van Buren
- banning slavery in any lands the US acquired from Mexico
- California entering the Union as a slave state
- a pro-slavery government in Kansas

What approach did Senator Stephen A. Douglas propose as an alternative to the Missouri Compromise? *

1 point

- Gadsden Purchase
- Texas-Maine Act
- popular sovereignty
- free soil

Which term refers to pro-slavery activists who crossed the Kansas border to vote? *

1 point

- border patrollers
- border ruffians
- lowans
- Missourians

In which state did rival pro-slavery and antislavery governments exist at the same time? *

1 point

- California
- Kansas
- Missouri
- Texas



What is the name for a war between citizens of the same country? *

1 point

- civil war
- cold war
- inter-country war
- undeclared war

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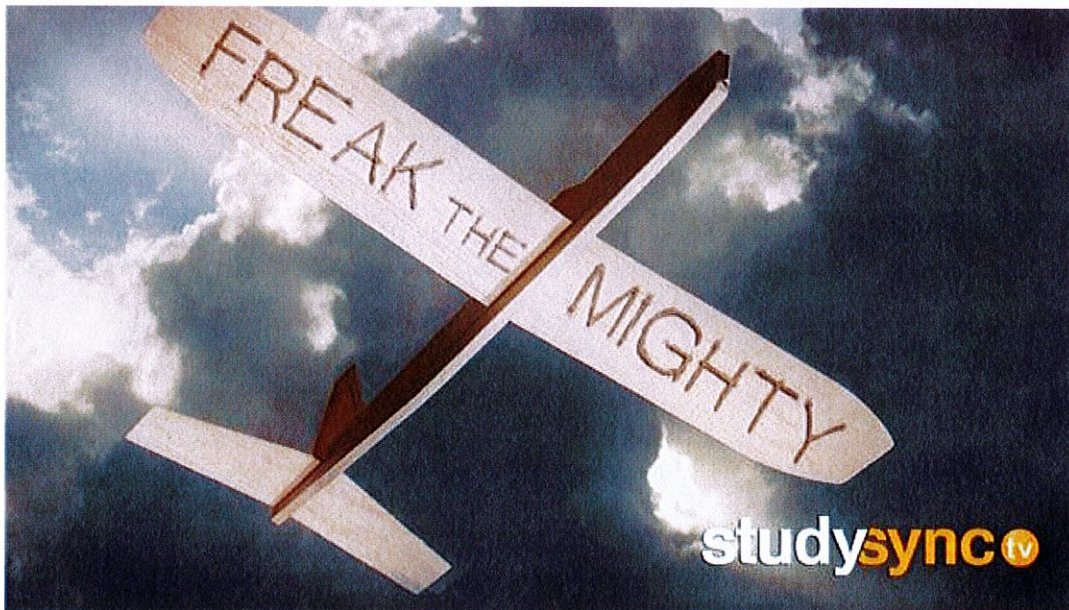
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Chapter Three: American Flyer

1

OK, back to the down under, right? My room in the basement. Scuttle into your dim hole in the ground, Maxwell dear. Big goon like you, growing about an inch a day, and this midget kid, this crippled little humanoid, he actually *scared* you. Not the kind of scare that makes your knee bones feel like water, more the kind of scare where you go whoa! I don't understand this, I don't get it, what's going on?

2

Like calling me "earthling." Which by itself is pretty weird, right? I already mentioned a few of the names I've been called, but until the robot boy showed up, nobody had ever called me *earthling*, and so I'm lying on my mattress there in the great down under, and it comes to me that he's right, I *am* an earthling, we're all of us earthlings, but we don't call each other earthling. No need. Because it's the same thing that in this country we're all Americans, but we don't go around to people and say, "Excuse me, American, can you tell me how to get to the nearest 7 Eleven?"

3

So I'm thinking about that for a while, lying there in the cellar dark, and pretty soon the down under starts to get small, like the walls are shrinking, and I go up the bulkhead stairs into the back yard and find a place where I can check it out.

4

There's this one scraggly tree behind the little freak's house, right? Like a stick in the ground with a few wimped out branches. And there he is, hardly any bigger now than he was in day care, and he's standing there waving his crutch up at the tree.

5

I kind of slide over to the chain-link fence, get a better angle on the scene. What's he *doing* whacking at that crummy tree? Trying to jump up and hit this branch with his little crutch, and he's mad, hopping mad. Only he can't really jump, he just makes this jumping kind of motion. His feet never leave the ground.

6

Then what he does, he throws down the crutch and he gets down on his hands and knees and crawls back to his house. If you didn't know, you would think he was like a kindergarten creeper who forgot how to walk, he's that small. And he crawls real good, better than he can walk. Before you know it, he's dragging this wagon out from under the steps.

7

Rusty red thing, one of those old American Flyer models. Anyhow, the little freak is tugging it backwards, a few inches at a time. Chugging along until he gets that little wagon under the tree. Next thing he picks up his crutch and he climbs in the wagon and he stands up and he's whacking at the tree again.

8

By now I've figured out that there's something stuck up in the branches and he wants to get it down. This small, bright-colored thing, looks like a piece of folded paper. Whatever it is, that paper thing, he wants it real bad, but even with the wagon there's no way he can reach it. No way.

9

So I go over there to his back yard, trying to be real quiet, but I'm not good at sneaking up, not with these **humongous** feet, and he turns and faces me with that crutch raised up like he's ready to hit a grand slam on my head.

10

He wants to say something, you can tell that much, but he's so mad, he's all huffed up and the noise he makes, it could be from a dog or something, and he sounds like he can hardly breathe.

11

What I do, I keep out of range of that crutch and just reach up and pick the paper thing right out of the tree. Except it's not a paper thing. It's a plastic bird, light as a feather. I have to hold it real careful or it might break, that's how flimsy it is.

12

I go, "You want this back or what?"

13

The little freak is staring at me bug-eyed, and he goes, "Oh, it talks."

14

I give him the bird-thing. "What is it, like a model airplane or something?"

15

You can tell he's real happy to have the bird-thing back, and his face isn't quite so fierce. He sits down in the wagon and he goes, "This is an ornithopter. An ornithopter is defined as an experimental device propelled by flapping wings. Or you could say that an ornithopter is just a big word for mechanical bird."

16

That's how he talked, like right out of a dictionary. So smart you can hardly believe it. While he's talking he's winding up the bird-thing. There's this elastic band inside, and he goes, "Observe and be amazed, earthling," and then he lets it go, and you know what? *I am* amazed, because it does fly around like a little bird, flitting up and down and around, higher than I can reach.

17

I chase after the thing until it boinks against the scrawny tree trunk and I bring it back to him and he winds it up again and makes it fly. We keep doing that, it must be for almost an hour, until finally the elastic breaks. I figure that's it, end of ornithopter, but he says something like, "All mechanical objects require **periodic maintenance**. We'll schedule **installation** of a new **propulsion** unit as soon as the Fair Gwen of Air gets a replacement."

18

Even though I'm not sure what he means, I go, "That's cool."

19

"You live around here, earthling?"

20

"Over there." I point out the house. "In the down under."

21

He goes, "What?" and I figure it's easier to show him than explain all about Gram and Grim and the room in the cellar, so I pick up the handle to the American Flyer wagon and I tow him over.

22

It's real easy, he doesn't weigh much and I'm pretty sure I remember looking back and seeing him sitting up in the wagon happy as can be, like he's really enjoying the ride and not embarrassed to have me pulling him around.

23

But like Freak says later in this book, you can remember anything, whether it happened or not. All I'm really sure of is he never hit me with that crutch.

#2 Vocabulary for Freak The Mighty

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What is your name? *

Your answer

Write a sentence using the word humongous. *

Your answer

Write a sentence using the word periodic. *

Your answer

Write a sentence using the word maintenance. *

Your answer

Write a sentence using the word installation. *

Your answer

Write a sentence using the word propulsion. *

Your answer



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Freak The Mighty- Quiz

* Required

What is your name? *

Your answer

How do you feel about judging other people by the way they look? Do our looks tell everything there is to know about us? Why or why not? *

Your answer

Why do you think the "robot boy" or Kevin, refers to Maxwell as "earthling"? *

Option 1

Use details from the story to explain how Maxwell confronts his fear of Kevin? *

Your answer

Write two or three connections that Maxwell and Kevin have made in order to form a friendship. *

Your answer

This is only one chapter from "Freak The Mighty." Would you like to read the rest of this book? Why or why not? *

Your answer



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Writing- Freak The Mighty

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* Required

What is your name? *

Your answer

Write a summary of the events that took place in Chapter 3 of "Freak the Mighty".

*

Your answer

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VOCABULARY GOEMETRY

Geometry- is the branch of mathematics that deals with lines, shapes, and space.

Line segment- a part of a line that has two endpoints.

Line- a line that continues forever in both directions.

Ray- a line with only one endpoint.

Point- the name of point using capital letter.

Parallel Lines- lines that are always the same distance apart. They never intersect.

Angle- formed by two rays with the same endpoint.

Vertex- the point of intersection of rays or lines that form an angle.

Right Angle- a 90 degree angle.

Perpendicular Lines- two lines that form a right angle.

Congruent Lengths/Angles- the shapes, lines, or angles are equal in size.

Plane Geometry- 2D flat shapes; polygons; 3 straight sides.

Solid Geometry- deals with solid shapes; 3D shapes; cubes, spheres

Ruler- a tool we measure distances as well as draw straight lines on diagrams.

Protractor- helps us calculate the measurement of an angle, as well as draw an accurate angle

Acute Angle- an angle measuring less than 90 degrees.

Obtuse Angle- An angle measuring greater than 90 degrees.

Complementary Angles- two angles whose "sum" is 90 degrees.

Supplementary Angles- two angles whose "sum" is 180 degrees.

Adjacent Angles- angles that share a vertex and a common side.

Vertical Angles- angles formed by two intersecting lines that are opposite each other. They have equal measures.

Congruent Angles- angles that are related because they have same measure.

Quadrilateral- is a polygon with four sides.

Parallelogram- opposite sides are parallel and equal in length.

Rectangle- a parallelogram where all four sides form right angles.

Rhombus- a parallelogram where all sides are equal in length.

Square- a parallelogram where all sides are equal in length and all sides form right angles.

Trapezoid- has exactly two parallel sides, which are called base1 and base2 sides do not have to be equal in lengths.

Perimeter- the distance around a two-dimensional object. To calculate the perimeter of an object, you add the length of all its sides.

Area- the size of a surface or is the amount of space inside a two-dimensional object. Area is written in "units squared"

Compound Shape- a shape made up of two or more other shapes; made up of quadrilaterals.

Triangle- has 3 sides and 3 angles

Equilateral Triangle- 3 equal sides; 3 equal angles (always equal 60 degrees)

Isosceles Triangle- 2 equal sides and angles

Scalene Triangle- no equal sides; no equal angles.

Hypotenuse- the longest side of a right angled triangle, which is always opposite side with right angle.

Pythagorean Theorem- used to find the length of a side of a right triangle.

Circle- is the set of all points that are equal distance from a point that is called the center.

Circumference © - the distance around the circle. (the perimeter of the circle)

Chord- a line segment whose endpoints are on the circle.

Diameter- a chord that passes through the center of the circle.

Radius- a line segment that has 1 endpoint at the center and other side on the circle.

Space Figure- a solid; 3-D figure; examples: cylinder, cube, sphere, pyramid

Volume- the number of cubic units needed to fill the figure.

Surface Area- is exactly what it sounds like- the area of a shapes surfaces.

We can find surface area by adding together the area of the bases and lateral faces.

Similar Figures- are figures that have the same shape, but not necessarily the same size.

Scale Drawing- is a drawing that is similar to an actual object for place- just made bigger or smaller.

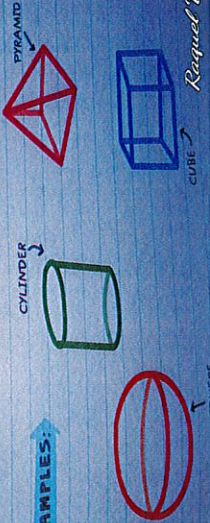
Scale- is ratio of the length in the drawing to the actual length.

Chapter 46

THREE-DIMENSIONAL FIGURES

A three-dimensional figure (3-D figure) is a shape that has length, width, and height. It is also called a "SPACE FIGURE" or a "solid."

EXAMPLES:



Requel Wayne

A **POLYHEDRON** is a 3-D figure that is made up of regions that are in the shape of polygons. The regions share a side. (The plural of polyhedron is **POLYHEDRA**.)

One type of polyhedron is a **PRISM**. A prism is a 3-D figure that has two polygon bases that are parallel and **CONGRUENT** (exactly the same shape and size), as well as **LATERAL** faces (the sides next to each other) that are parallelograms. Prisms are categorized by the type of bases they have.

A **RECTANGULAR PRISM** has all right angles, the bases are parallel, and the lateral faces are parallelograms.

A **TRIANGULAR PRISM** has bases that are parallel triangles and lateral faces that are parallelograms.

And other types:
PENTAGONAL PRISM
HEXAGONAL PRISM

There are other types of polyhedra.
 A **CYLINDER** has two parallel bases that are congruent circles.

LATERAL side(s) of something

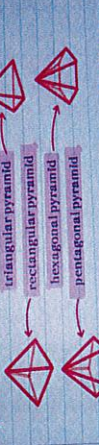


Requel Wayne

A **CONE** has one circular base and one vertex (or point).

A **SPHERE** is a set of points in a space that are a given distance from a center point (it looks just like a ball).

A **PYRAMID** has a polygon (not a circle) for its base. All of its lateral faces are triangles. Similarly, pyramids are named by their bases.



There is a special type of polyhedron called a **REGULAR POLYHEDRON**. A regular polyhedron is a polyhedron where all the faces are identical polygons, such as:

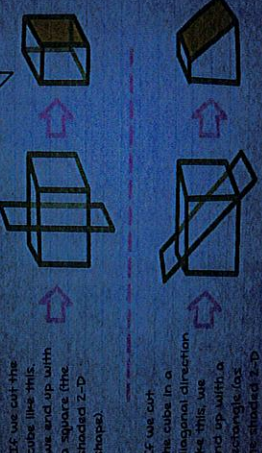


Requel Wayne

Imagine that we are slicing a 3-D polyhedron open—you can get different 2-D shapes depending on how you slice it. These are known as **CROSS SECTIONS**.

If we slice a cube open with a plane, what are the possible cross sections that we can get?

ANY POLYHEDRON CAN BE PAPER-FOLDED!

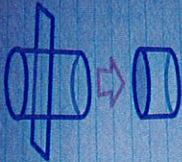


If we cut the cube like this, we end up with a square (the shaded 2-D shape).

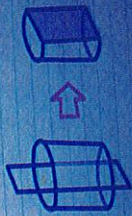
If we cut the cube in a diagonal direction like this, we end up with a rectangle (or the shaded 2-D shape).

Requel Wayne

If you slice a cylinder with a plane, there are a few possible cross sections that can result.



If we slice the cylinder horizontally, the resulting 2-D cross section is a circle (the shaded region).



If we slice the cylinder vertically, the resulting 2-D cross section is a rectangle (the shaded region).

CHECK YOUR KNOWLEDGE

For 1 through 8 match each shape to its name.

- 1 Rectangular prism
- 2 Cube
- 3 Pyramid
- 4 Cone
- 5 Cylinder
- 6 Rectangular pyramid
- 7 Octagonal pyramid
- 8 Triangular pyramid

1 State the definition of a regular polyhedron and draw a sample of a regular polyhedron.

Raquel Wayne

For 10 through 13, what is the shape of each cross section?

- 10.
- 11.
- 12.
- 13.

ANSWERS *Raquel Wayne*

check your knowledge 5

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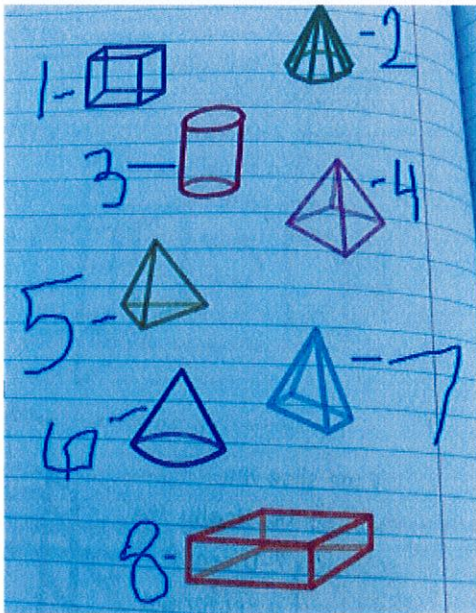
write your name

Your answer



match each shape to its name (There is only one correct answer per row) 8 points

*



	shape 1	shape 2	shape 3	shape 4	shape 5	shape 6	shape 7	shape 8	Column 9
rectangular prism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cube	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
pyramid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cylinder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
rectangular pyramid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
octagonal pyramid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
triangular pyramid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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VOLUME

The **VOLUME** of a 3-D figure refers to the number of cubic units needed to fill the figure. Or, put more simply, "How much will fit in here?" The answer is the volume.



CONES ARE THE ONLY EXCEPTED CASE ON THIS LIST!!!

PRISMS
In order to **FIND THE VOLUME OF MOST PRISMS**, use the formula.

Volume = Area of the base x Height of the prism
or $V = Bh$

We use a capital B to indicate that it's the area of the base and that the answer is in **units³**.

Requel Wayne

Rectangular Prisms

To find the **VOLUME OF A RECTANGULAR PRISM**, we can use

$V = Bh$ or $V = \text{length} \times \text{width} \times \text{height}$ ($V = lwh$)

because, in actuality, those are exactly the same equations.

EXAMPLE: Find the volume of the rectangular prism.

If we use $V = Bh$, first, we must find the value for B , or the area of the rectangular base. (The formula for the area of a rectangle is $A = l \times w$)
 $B = l \times w$
 $B = 5 \times 3$
 $B = 15$
 Now we have all the information to find volume.
 $V = Bh$
 $V = 15 \times 4$
 $V = 60 \text{ ft}^3$

Or we can use $V = lwh$, where all of those steps are included!
 $V = lwh$
 $V = (5)(3)(4)$
 $V = 60 \text{ ft}^3$

Requel Wayne

VOLUME

The **VOLUME** of a 3-D figure refers to the number of cubic units needed to fill the figure. Or, put more simply, "How much will fit in here?" The answer is the volume.



CONES ARE THE ONLY EXCEPTED CASE ON THIS LIST!!!

PRISMS
In order to **FIND THE VOLUME OF MOST PRISMS**, use the formula.

Volume = Area of the base x Height of the prism
or $V = Bh$

We use a capital B to indicate that it's the area of the base and that the answer is in **units³**.

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Triangular Prisms

For the same reasons, in order to find the **VOLUME OF A TRIANGULAR PRISM**, we can use

$V = Bh$ or $V = \frac{1}{2} \times \text{base} \times \text{height of the triangle} \times \text{height of the prism}$
 ($V = \frac{1}{2} bh_1h_2$)

EXAMPLE: Find the volume of the triangular prism.

$B = \frac{1}{2}bh_1$
 $B = \frac{1}{2}(4)(3)$
 $B = 24$
 $V = Bh_2$
 $V = 24 \times 18$
 $V = 432 \text{ ft}^3$

You may also use $V = \frac{1}{2}bh_1h_2$ where h_1 represents the height of the triangle and h_2 represents the height of the prism (shown above).

3-D FIGURES THAT ARE NOT PRISMS
Cylinders
 To find the **VOLUME OF A CYLINDER**, we can use

$V = Bh$ or $V = \pi r^2 h$

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$V = Bh$ or $V = \pi r^2 h$

In a cylinder, the base is a circle, so we use the formula for the area of a circle ($A = \pi r^2$) to find the area of the base.

EXAMPLE: Find the volume of the cylinder.

$V = \pi r^2 h$
 $V = (3.14)(3^2)(5)$
 $V = 141.3 \text{ in}^3$

Cones
 Cones are a little different from other 3-D figures— to calculate the **VOLUME OF A CONE**, use the formula:

$V = \frac{1}{3} \times \text{area of the base} \times \text{height}$ ($V = \frac{1}{3} Bh h$)
 or
 $V = \frac{1}{3} \times \pi \times \text{radius}^2 \times \text{height}$ ($V = \frac{1}{3} \pi r^2 h$)

The volume of three cones added together amounts to a cylinder, so that's why the volume of a cone is $\frac{1}{3}$ of the area of the base x height.

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Like a cylinder, the base of a cone is a circle, so we can use the formula for the area of a circle ($A = \pi r^2$) to find the area of the base. So, if we combine the formulas, we get: $V = \frac{1}{3} \pi r^2 h$.

EXAMPLE Find the volume of the cone.

Round to the nearest hundredth.

$$V = \frac{1}{3} \pi r^2 h$$

$$V = \frac{1}{3} (\pi) (6^2) (8)$$

$$V = \frac{1}{3} (3.14) (36) (8)$$

$$V = 301.44 \text{ in}^3$$



Pyramids

Similarly, to calculate the **VOLUME OF A PYRAMID**, we can use

$$\left\{ V = \frac{1}{3} Bh \right\}$$

(like the cylinder, the volume of three pyramids put together amounts to a prism). This base is a rectangle, so we can calculate its area (B) with the formula $A = Bh$ —just be careful not to confuse the height of the pyramid with the height of *Requiel Wayne*.

Find the volume of the pyramid.

$$A = 10 \text{ ft}^2$$

$$h = 40 \text{ ft}$$

$$V = \frac{1}{3} Bh$$

$$V = \frac{1}{3} (10)(40)$$

$$V = 800 \text{ ft}^3$$



Spheres

To calculate the **VOLUME OF A SPHERE**, we use the formula

$$\left\{ V = \frac{4}{3} \pi r^3 \right\}$$

All you need is the radius and then you can solve. And in a sphere, every line from the center to the edge is a radius!

EXAMPLE Find the volume of the sphere.

$$V = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} (3.14) (6^3)$$

$$V = \frac{4}{3} (3.14) (216)$$

$$V = 904.32 \text{ in}^3$$



CHECK YOUR KNOWLEDGE

For 1 through 5, match each figure with its formula for volume. (Each figure may match more than one formula, and more than one figure may match each formula.)

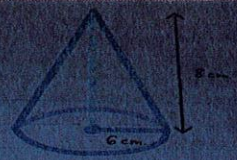
- 1. RECTANGULAR PRISM $V = lwh$
- 2. CONE $V = \frac{1}{3} Bh$
- 3. PYRAMID $V = \pi r^2 h$
- 4. CYLINDER $V = \frac{4}{3} \pi r^3$
- 5. SPHERE $V = \frac{1}{3} \pi r^2 h$

6. Find the volume of the rectangular prism.

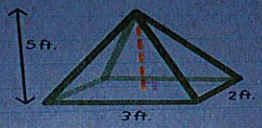


Raquel Wayne

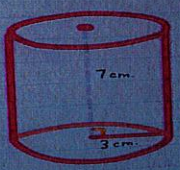
7. Find the volume of the cone.



8. Find the volume of the pyramid.



9. Find the volume of the cylinder.



10. Find the volume of the sphere.



Raquel Wayne

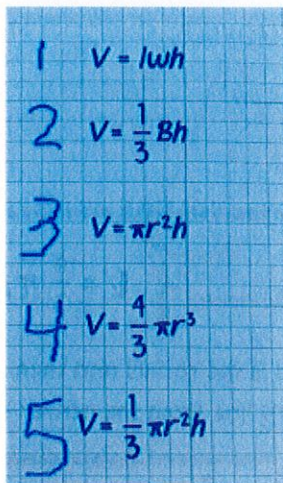
check your knowledge 8

* Required

write your name *

Your answer

math each figure with its volume formula (there is one figure that has 2 correct answers!) * 6 points

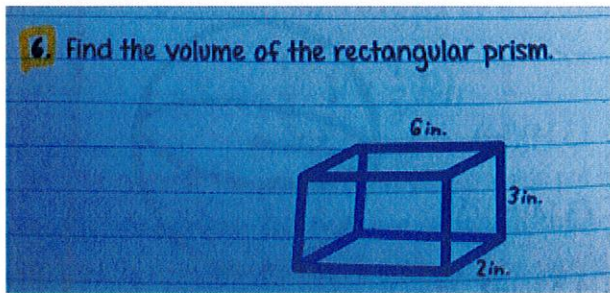


	formula 1	formula 2	formula 3	formula 4	formula 5
rectangular prism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
pyramid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cylinder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
sphere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



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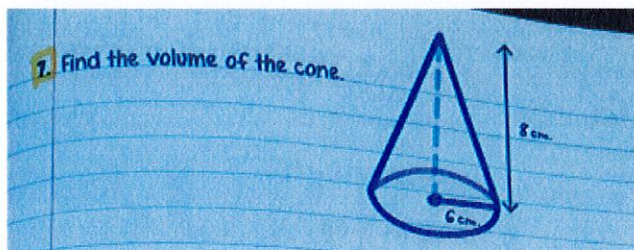
1 point



- 36
- 38
- 11

*

1 point

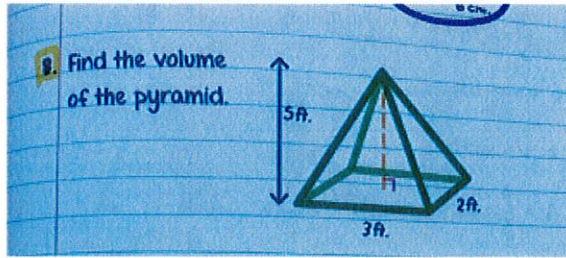


- 302.44
- 301.44
- 300



*

1 point



- 10
- 20
- 7

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Week of May 25#4 Word definition- Metabolism

Metabolism-

Cell-

Cell's metabolism-

Glucose-

Cellular respiration-

ATP-

Photosynthesis-

Metabolic pathway-

Anabolic pathways-

Catabolic pathways –

Enzymes-