

Module 5 - Lesson 1:

Analyze hierarchies and identify properties of quadrilaterals.

CCSS Standard – 5.G.B.3 / 5.G.B.4

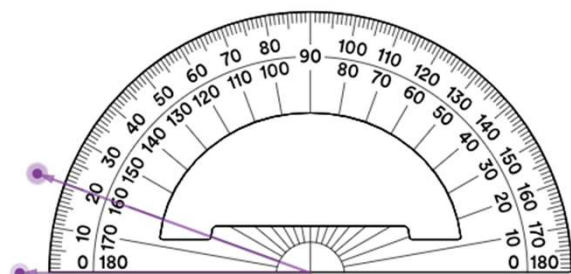
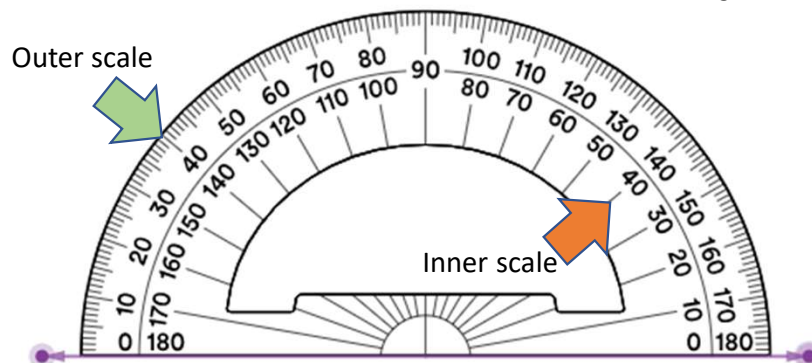
FLUENCY (10-min)

Counting on the Protractor

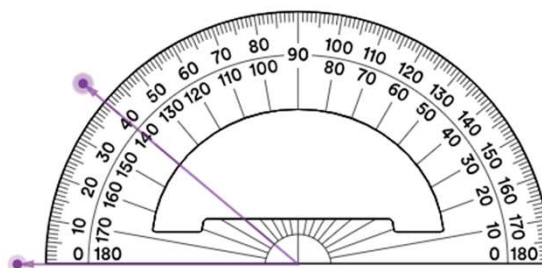
Use interactive protractor
on Digital Great Minds.



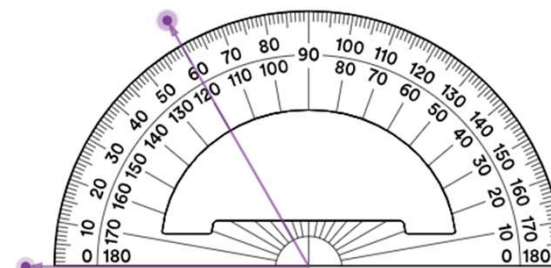
Look at the **outer scale** of the protractor.



Outer scale
ACUTE ANGLE
 20°



Outer scale
ACUTE ANGLE
 40°

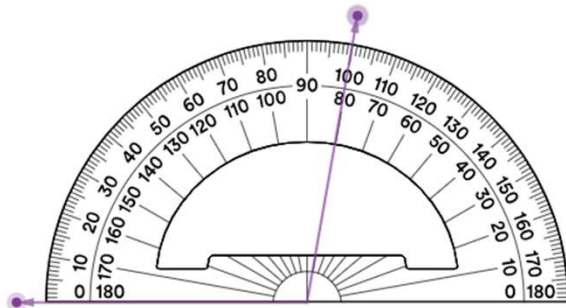


Outer scale
ACUTE ANGLE
 60°

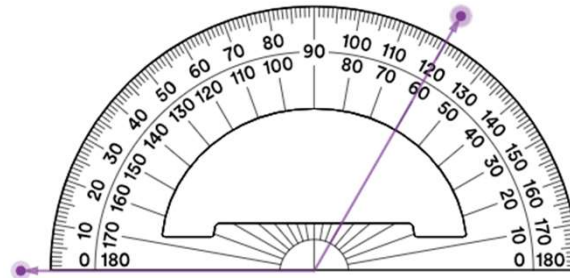
FLUENCY (10-min)

Counting on the Protractor

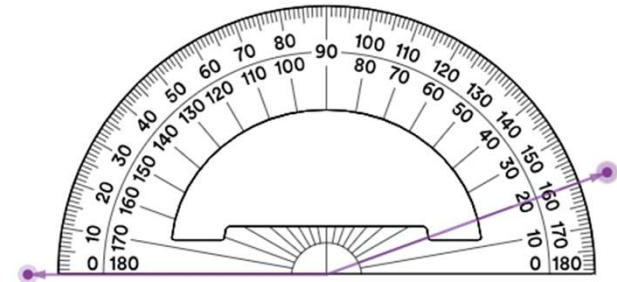
Use interactive protractor
on Digital Great Minds.



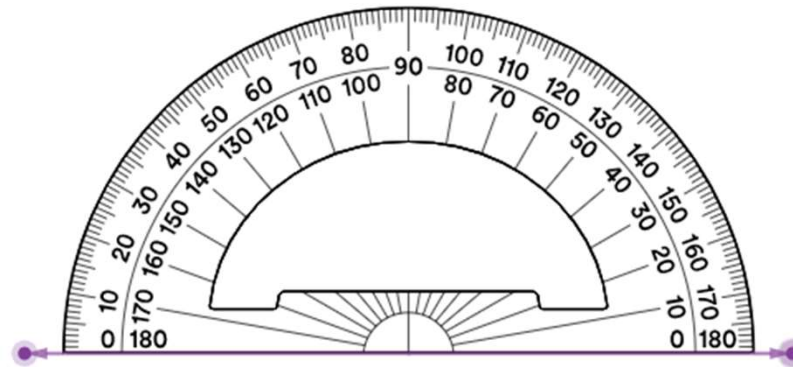
Outer scale
OBTUSE ANGLE
 100°



Outer scale
OBTUSE ANGLE
 120°



Outer scale
OBTUSE ANGLE
 160°



STRAIGHT ANGLE
 180°

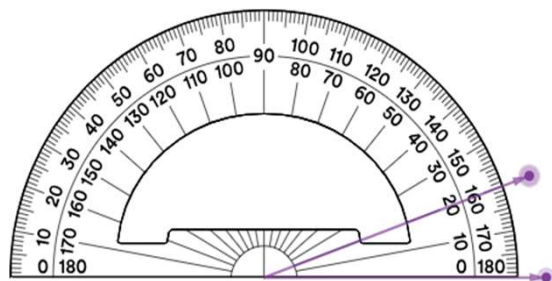
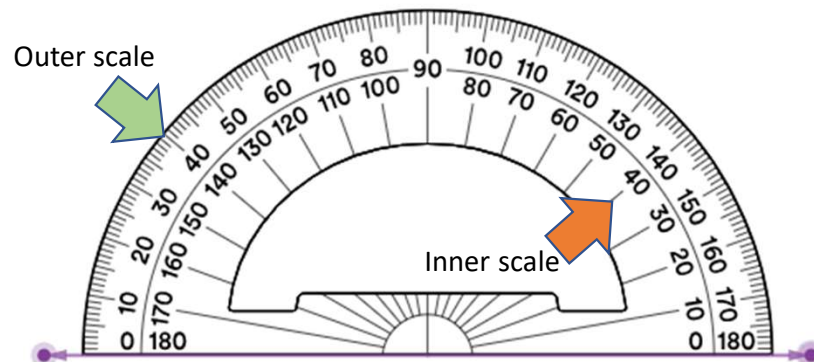
FLUENCY (10-min)

Counting on the Protractor

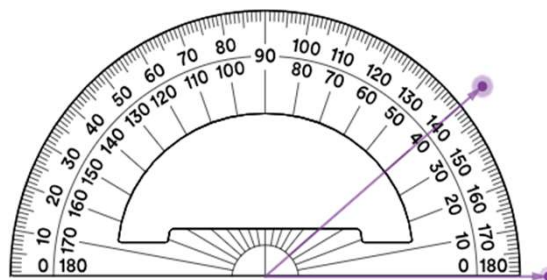
Use interactive protractor
on Digital Great Minds.



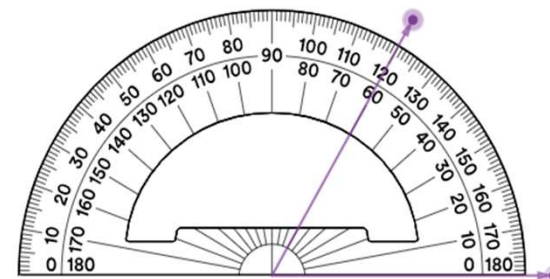
Now look at the **inner scale** of the protractor.



Inner scale
ACUTE ANGLE
 20°



Inner scale
ACUTE ANGLE
 40°

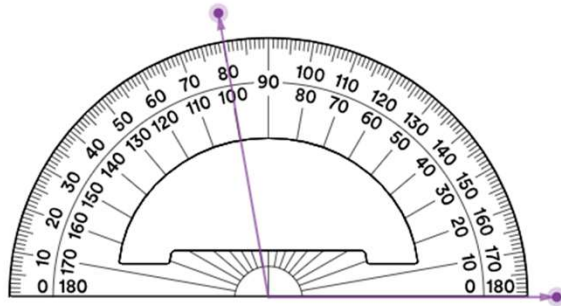


Inner scale
ACUTE ANGLE
 60°

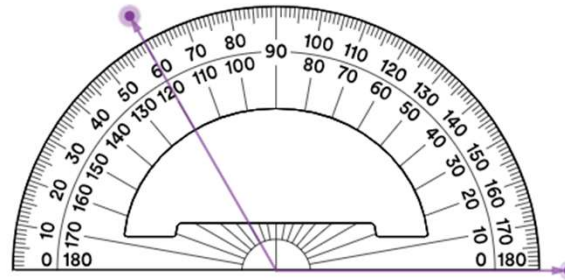
FLUENCY (10-min)

Counting on the Protractor

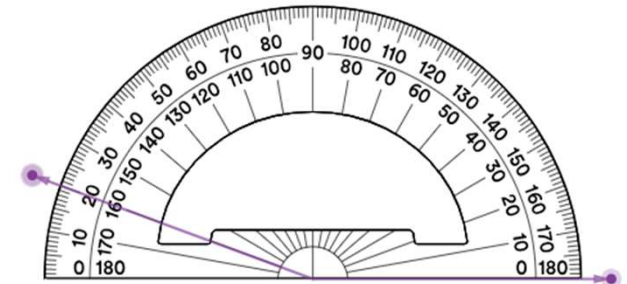
Use interactive protractor
on Digital Great Minds.



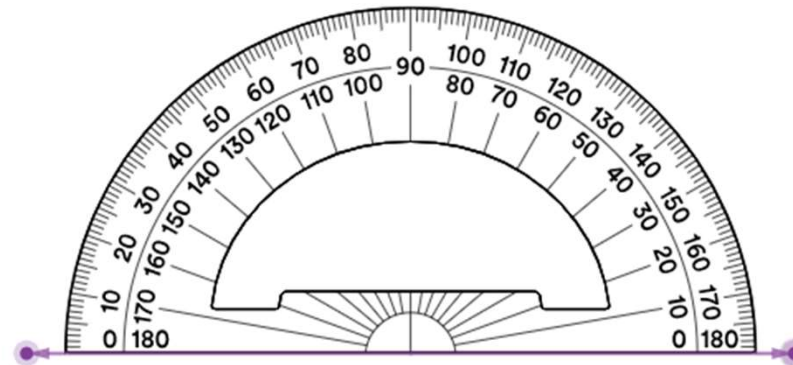
Inner scale
OBTUSE ANGLE
 100°



Inner scale
OBTUSE ANGLE
 120°



Inner scale
OBTUSE ANGLE
 160°

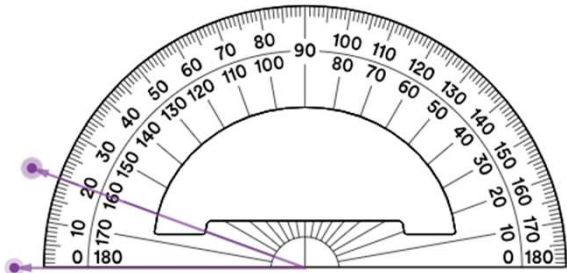


STRAIGHT ANGLE
 180°

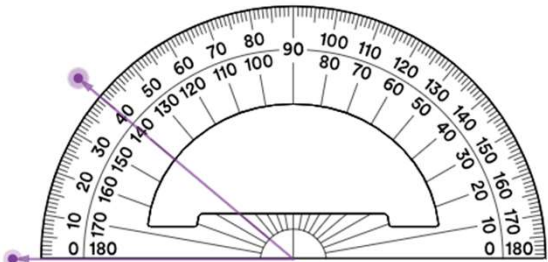
FLUENCY (10-min)

Counting on the Protractor

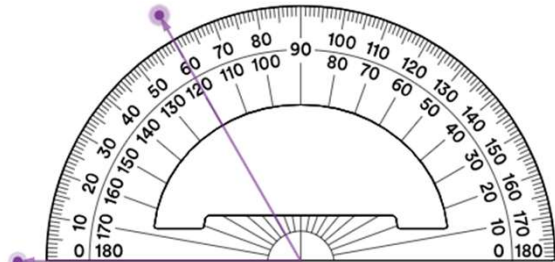
Let's compare the same angles on the inner and outer scales of the protractor.



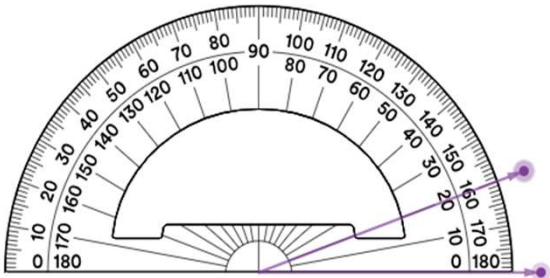
Outer scale
ACUTE ANGLE
20°



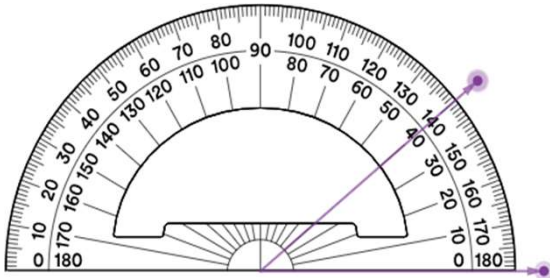
Outer scale
ACUTE ANGLE
40°



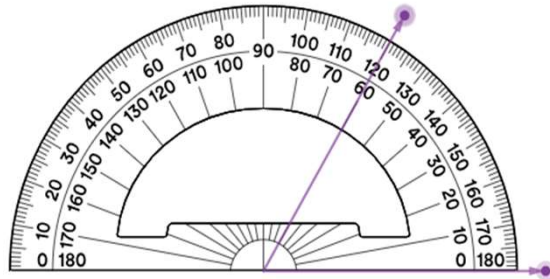
Outer scale
ACUTE ANGLE
60°



Inner scale
ACUTE ANGLE
20°



Inner scale
ACUTE ANGLE
40°



Inner scale
ACUTE ANGLE
60°

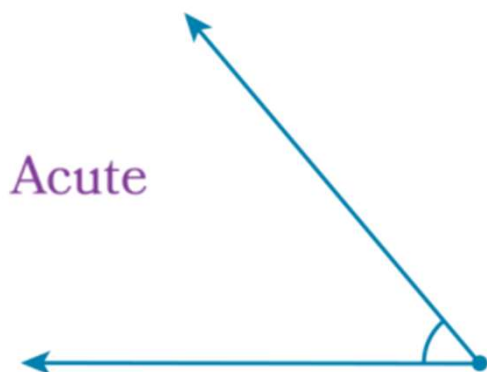
FLUENCY (10-min)

Choral Response: Classify and Measure Angles.

Raise your hand when you know the answer to each question.

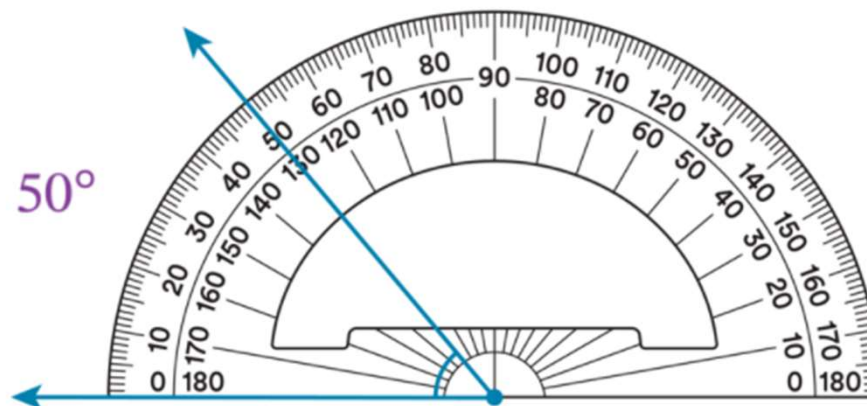
Wait for my signal to say the answer.

How would you classify this angle?



Estimate the angle measure.

What is the angle measure?

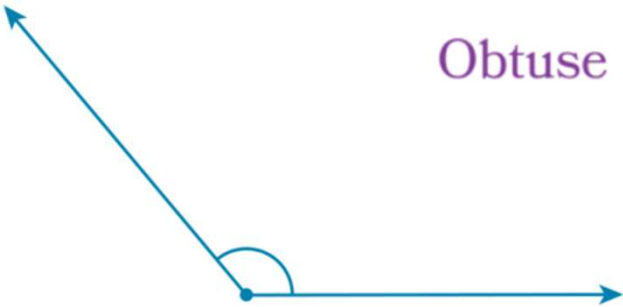


FLUENCY (10-min)

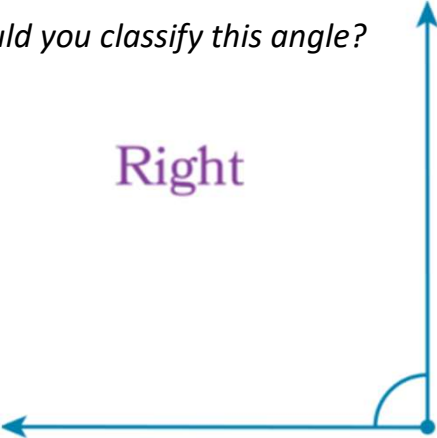
Choral Response: Classify and Measure Angles.

Raise your hand when you know the answer to each question.
Wait for my signal to say the answer.

How would you classify this angle?



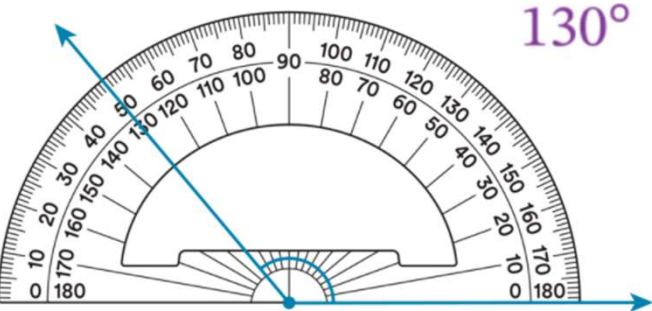
How would you classify this angle?



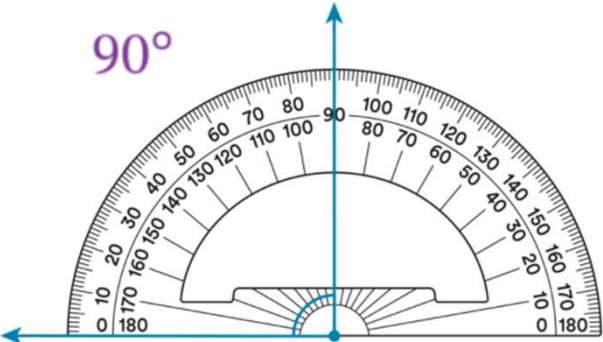
How would you classify this angle?



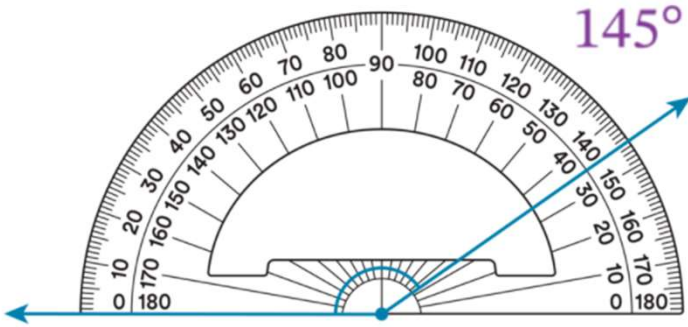
Estimate the angle measure.
What is the angle measure?



Estimate the angle measure.
What is the angle measure?



Estimate the angle measure.
What is the angle measure?



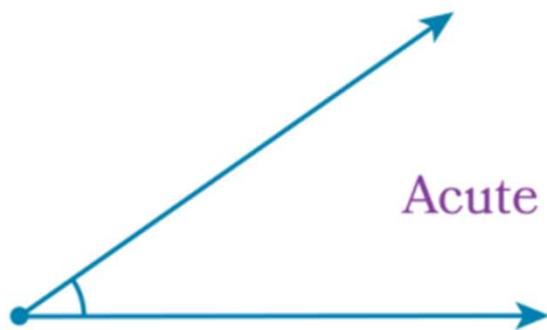
FLUENCY (10-min)

Choral Response: Classify and Measure Angles.

Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

How would you classify this angle?



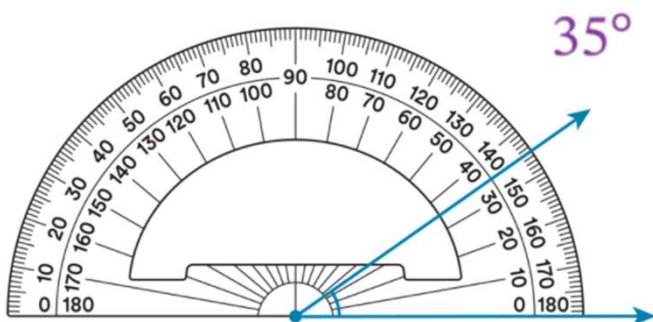
How would you classify this angle?



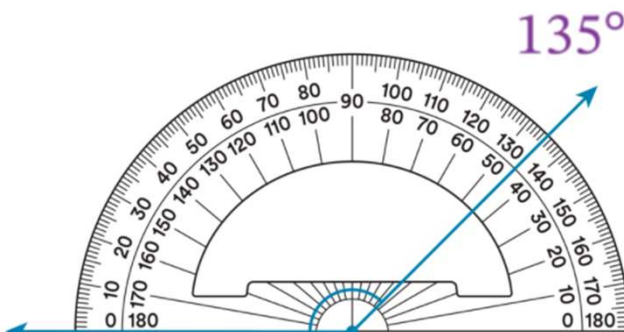
How would you classify this angle?



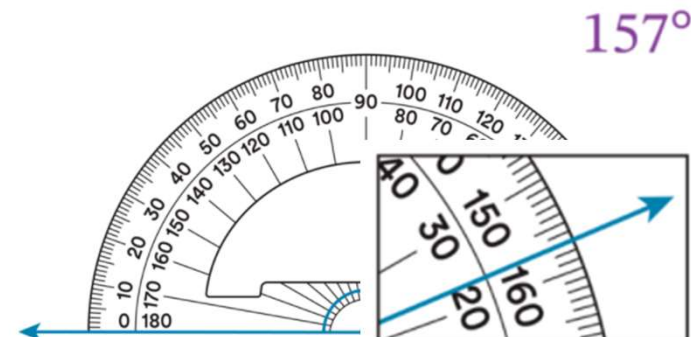
Estimate the angle measure.
What is the angle measure?



Estimate the angle measure.
What is the angle measure?



Estimate the angle measure.
What is the angle measure?



FLUENCY (10-min)

Choral Response: Attributes of Polygons

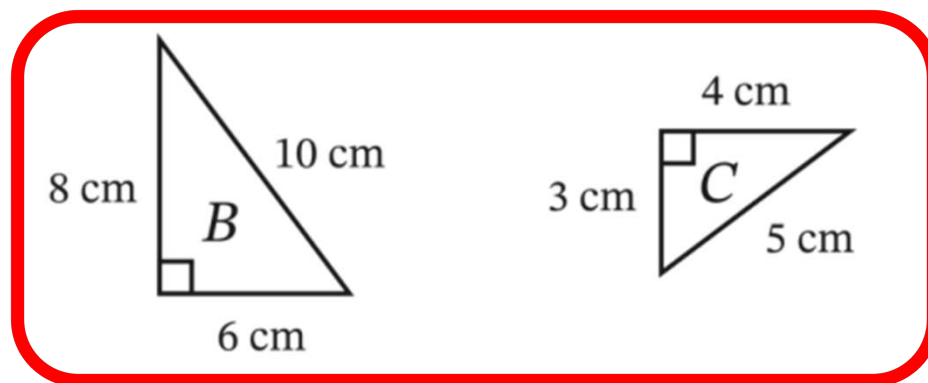
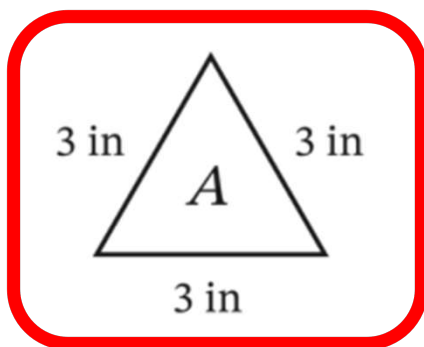
Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

Attributes: 3 sides, 3 vertices, and 3 angles

What is the name of the polygon with 3 sides, 3 vertices, and 3 angles?

triangle



Which triangles have at least 2 sides of equal length?

Which triangles have at least 1 right angle?

FLUENCY (10-min)

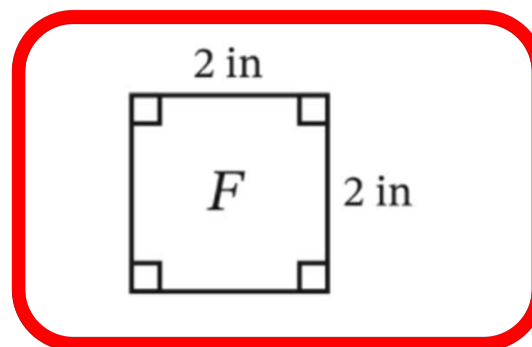
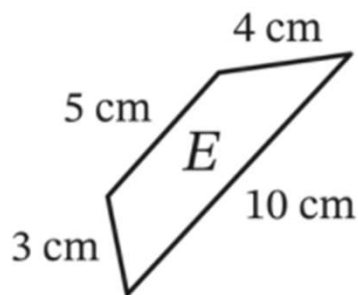
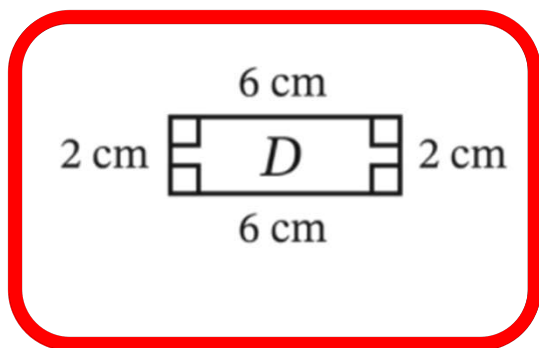
Choral Response: Attributes of Polygons

Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

Attributes: 4 sides, 4 vertices, and 4 angles

What is the name of the polygon with 4 sides, 4 vertices, and 4 angles? quadrilateral



Which quadrilaterals have at least 2 sides of equal length?

Which quadrilaterals have at least 1 right angle?

FLUENCY (10-min)

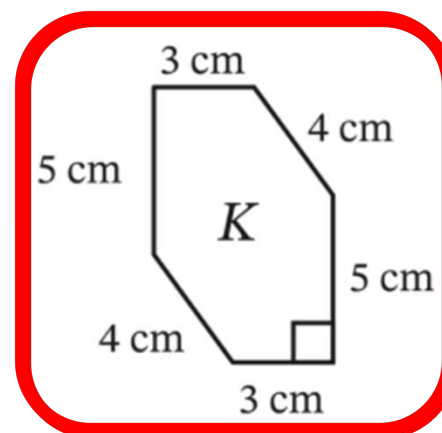
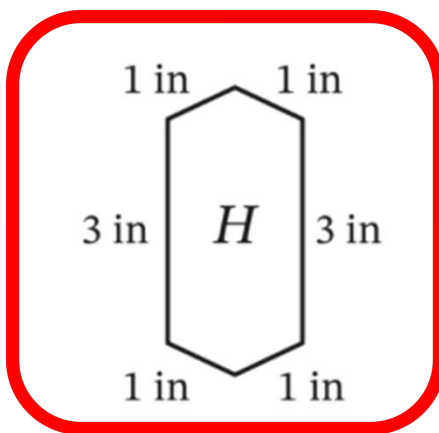
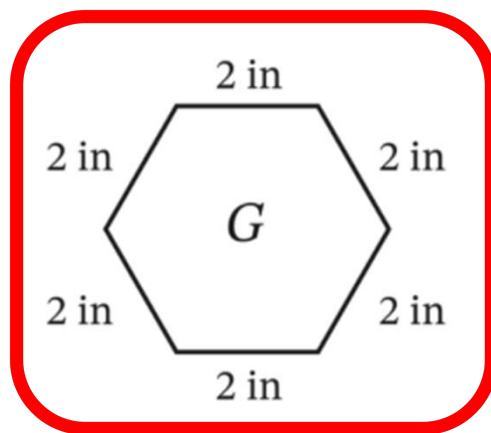
Choral Response: Attributes of Polygons

Raise your hand when you know the answer to each question.

Wait for my signal to say the answer.

Attributes: 6 sides, 6 vertices, and 6 angles

What is the name of the polygon with 6 sides, 6 vertices, and 6 angles? hexagon



Which hexagons have at least 2 sides of equal length?

Which hexagons have at least 1 right angle?

LAUNCH (5-min)

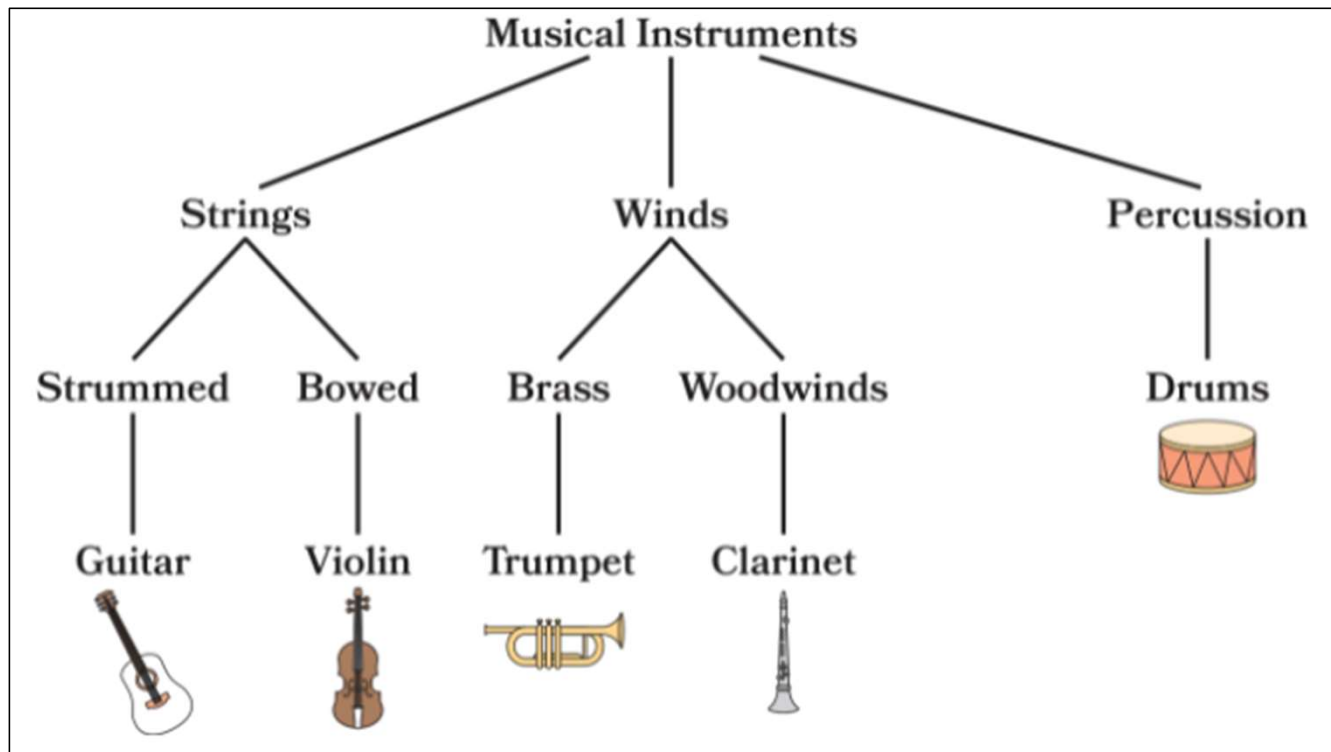
Explore how to use and interpret a hierarchy.

THINK-PAIR-SHARE:

What do you think the diagram represents?

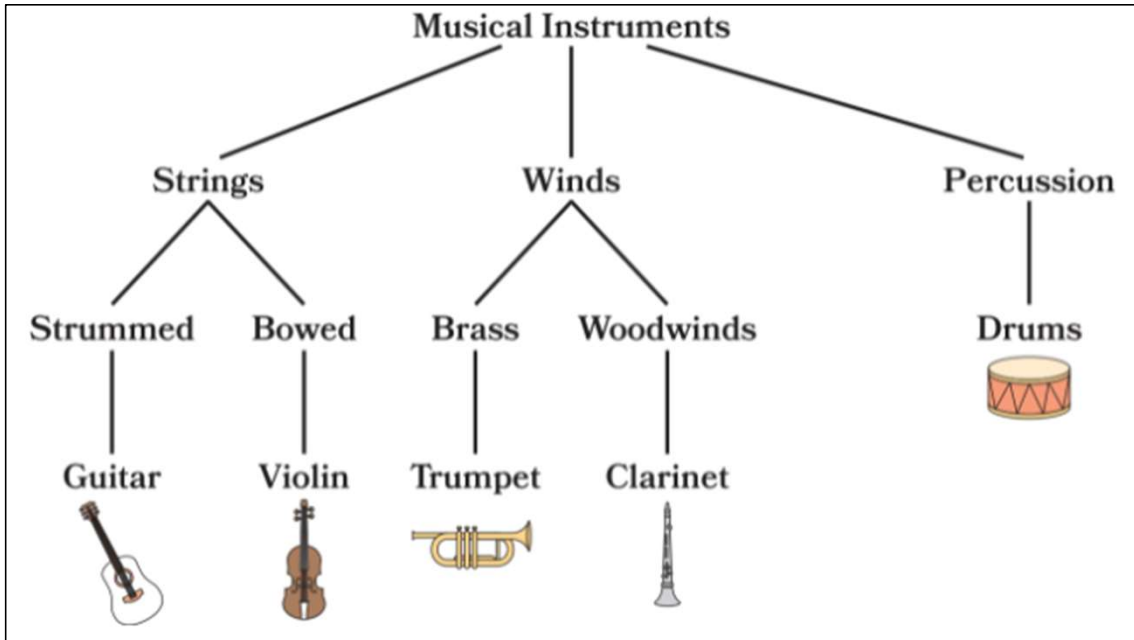
This diagram represents types of musical instruments.

Let's use it to determine whether statements are true or false?



LAUNCH (5-min)

Explore how to use and interpret a hierarchy.



How do you know from the diagram that not all wind instruments are brass?

Wind instruments can also be woodwinds

This diagram represents a **hierarchy**. A hierarchy places objects into groups based on their characteristics. In a hierarchy, objects may be placed above or below other objects.

A trumpet is a type of brass instrument, so the trumpet is listed under brass instruments in the hierarchy. We could call trumpet a brass instrument, but we call it a trumpet because trumpet is a more specific name.

All musical instruments are string instruments.

FALSE

All percussion instruments are musical instruments.

TRUE

All brass instruments are winds.

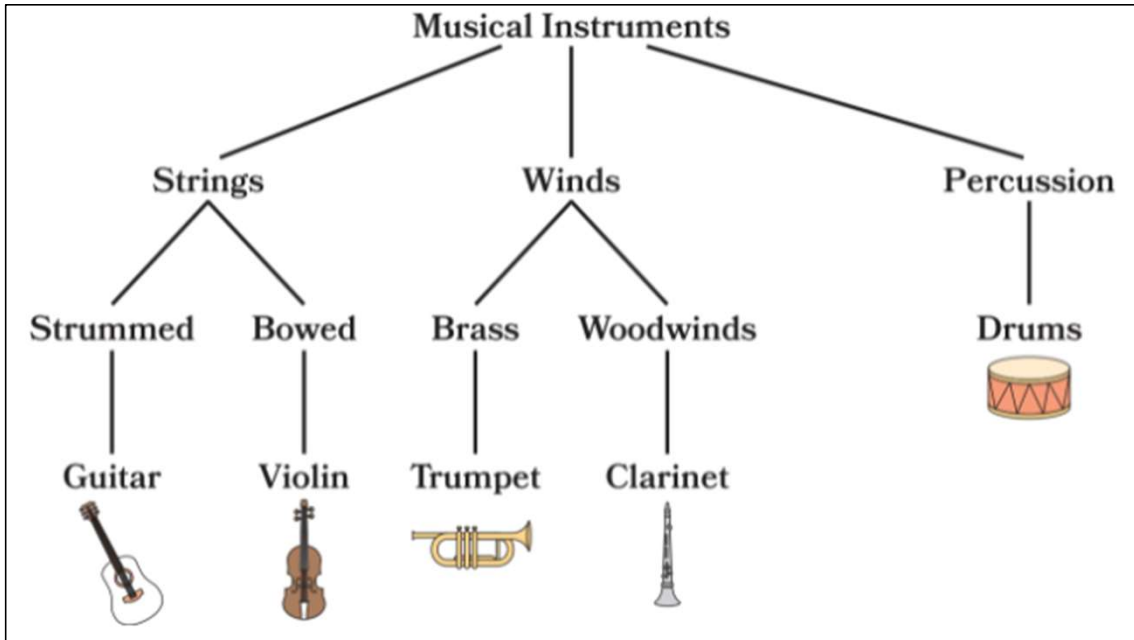
TRUE

All musical instruments are string instruments.

FALSE

LEARN (35-min)

Explore a Hierarchy



A **property** (characteristic) of musical instruments is that they make musical sounds. Every object listed below “Musical Instruments” in the hierarchy must therefore make musical sounds.

String instruments are made of wood. Is a violin made of wood? How do you do know?

According to this hierarchy, the most **specific** name for a guitar is guitar. But we could also call it a “strummed string instrument” or just a musical instrument.

According to the hierarchy, what are other names for a clarinet?

A woodwind.

A wind instrument.

A musical instrument.

*Yes. The violin is made of wood because the violin is a **string instrument**, and **all string instruments are made of wood**.*

*If every string instrument is made of wood, then a property of all string instruments is that they are made of wood. **A property is something that is TRUE of everything in a category.***

LEARN (35-min)

Explore a Hierarchy



This violin has a star painted on it. Do you think all violins have stars painted on them?

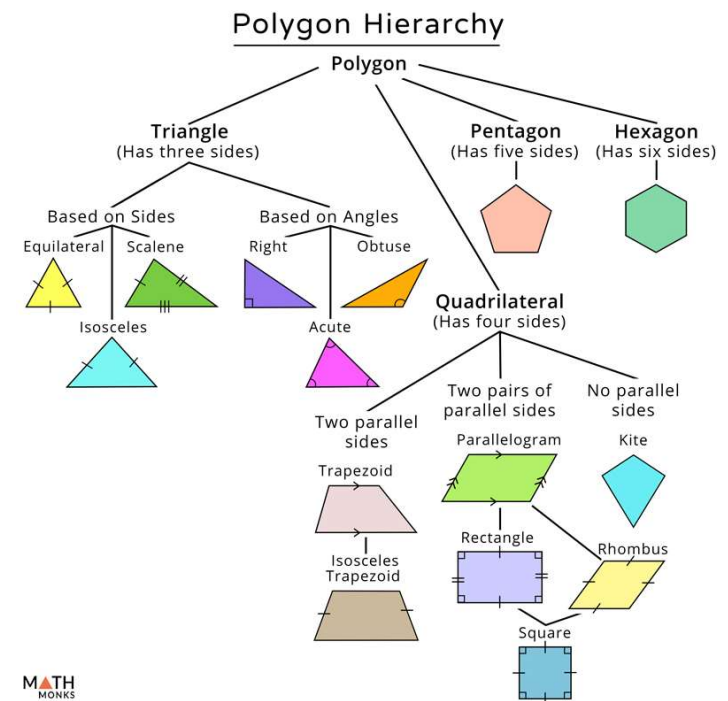
No. The star is a characteristic of THIS violin, but not all violins.

Is having a star painted on it a property of violins?

No. For a characteristic to become a property, it must be true about ALL violins. Being made of wood is a property of all violins.

Take-Away:

We build hierarchies in mathematics because we have **precise definitions** and can make statements that are true. Let's start putting this to work with triangles.



LEARN (35-min)

Explore a Hierarchy

What is true about **all** triangles?

All triangles have 3 sides, so a property of triangles is having 3 sides.

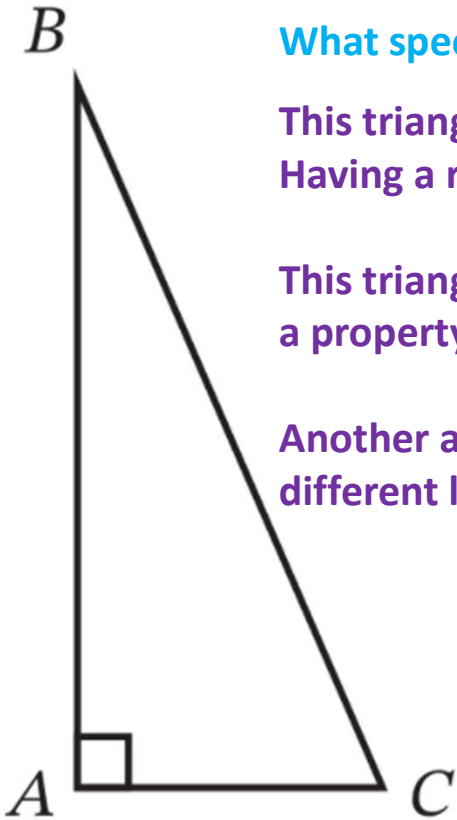
What specific property does this triangle have?

This triangle is a right triangle because it has a right angle.

Having a right angle is a property of right triangles, but not all triangles!

This triangle also has **attributes** that are not properties. It is taller than it is wide. This is not a property because it is not true of all triangles.

Another attribute is that it has vertices named A, B, and C. Other right triangles may have different letters.



LEARN (35-min)

Sort Figures

LEARN book page 5.

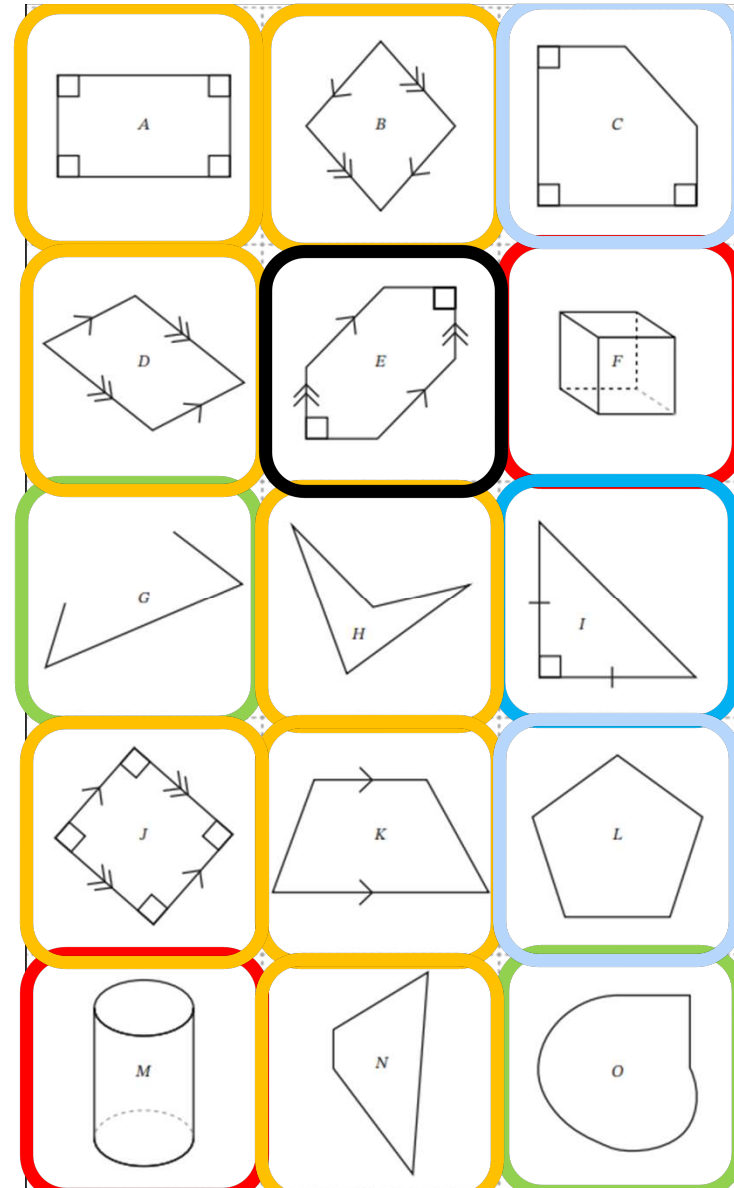
TASK: With a partner, sort your figures into **two-dimensional figures** and **three-dimensional figures**. How do you know the difference?

2-D figures lie on a plane. A plane is a flat, two-dimensional surface that extends forever. The surface of a piece of paper lies on a plane because it is flat. A pencil does not line in a plane because it is not flat.

Now, sort the two-dimensional figures into **polygons** and **non-polygons**.

A polygon is a **CLOSED** figure. A polygon has 3 or more **STRAIGHT** sides. A polygon is two-dimensional. These four figures are eliminated.

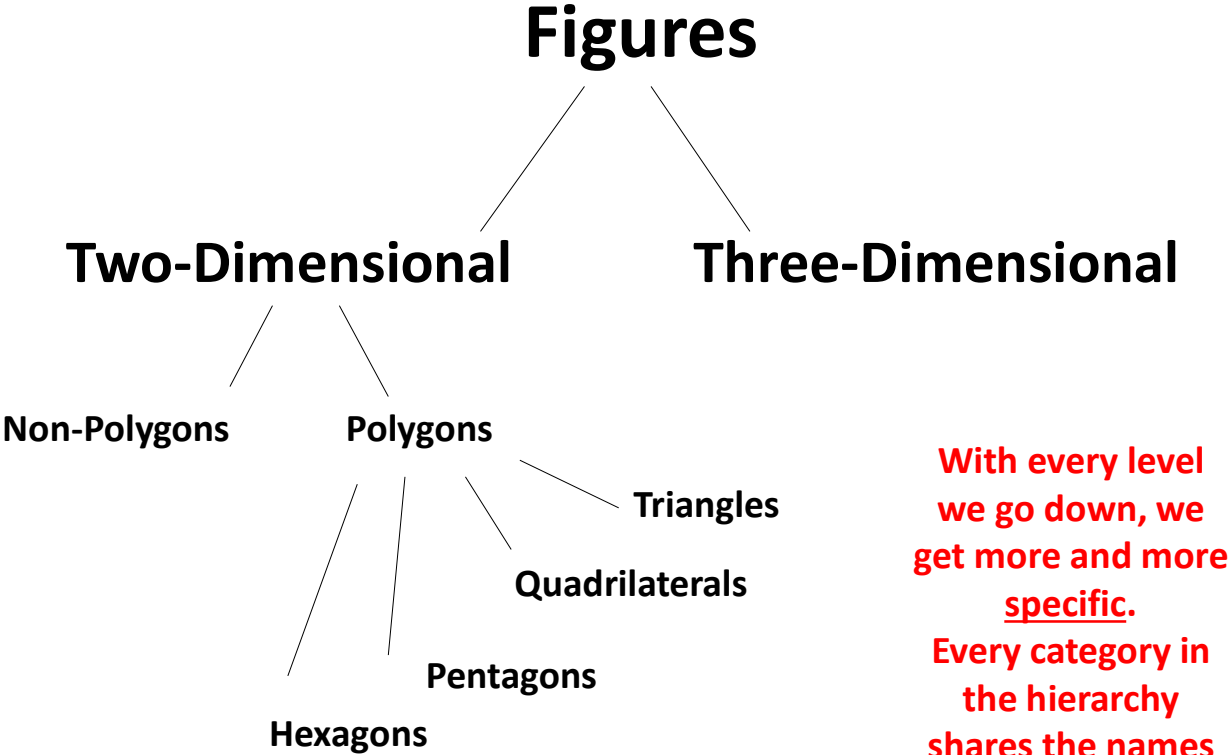
Now, sort the polygons into **triangles**, **quadrilaterals**, **pentagons**, and **hexagons**.



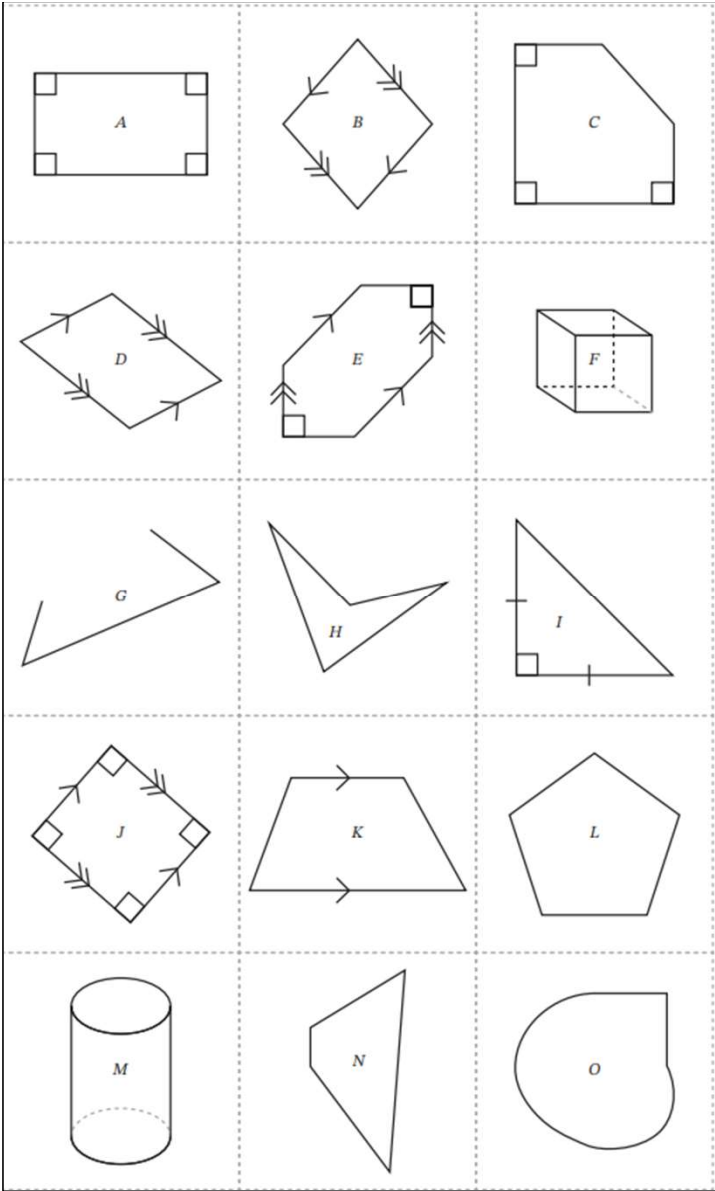
LEARN (35-min)

Create a Hierarchy

Let's use our figures sort to create a hierarchy.



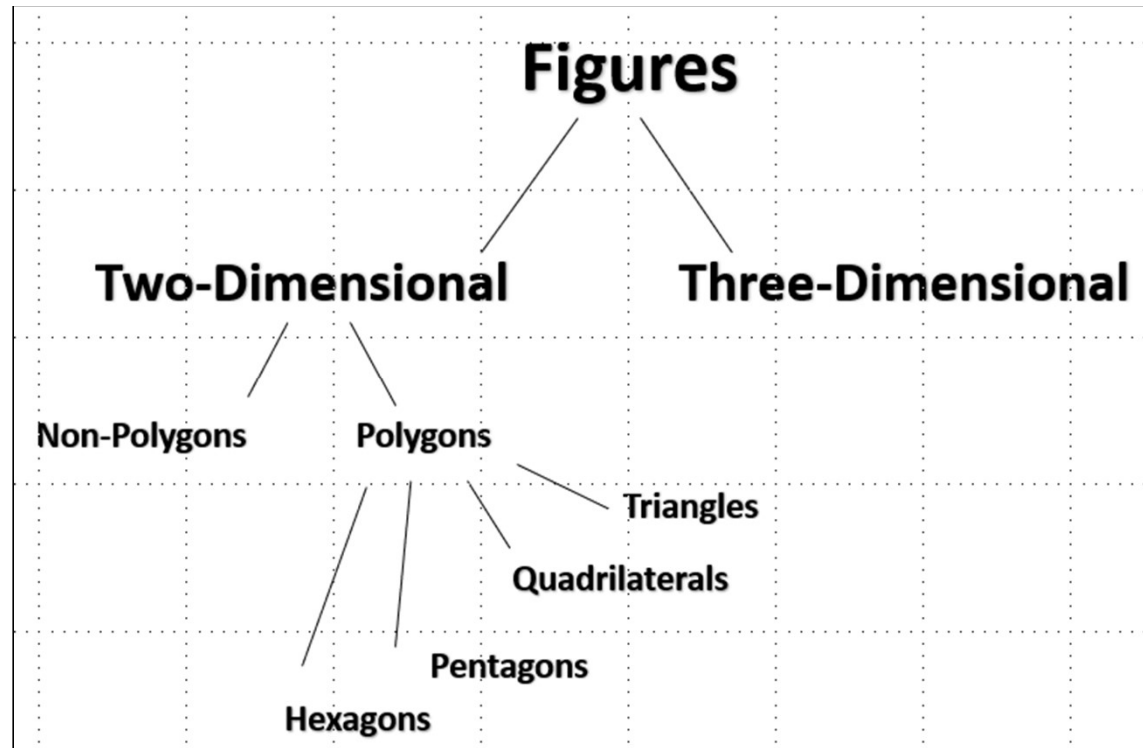
With every level we go down, we get more and more specific. Every category in the hierarchy shares the names and properties of the types above it.



LEARN (35-min)

TRUE OR FALSE

Let's use our figures sort to create a hierarchy.



All pentagons are two-dimensional.

TRUE

All quadrilaterals are polygons.

TRUE

All polygons are quadrilaterals.

FALSE

LEARN (35-min)

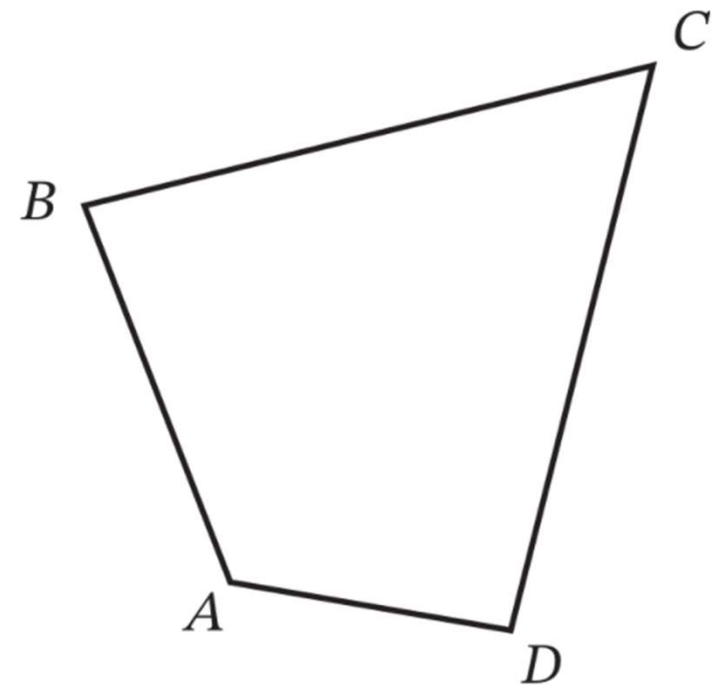
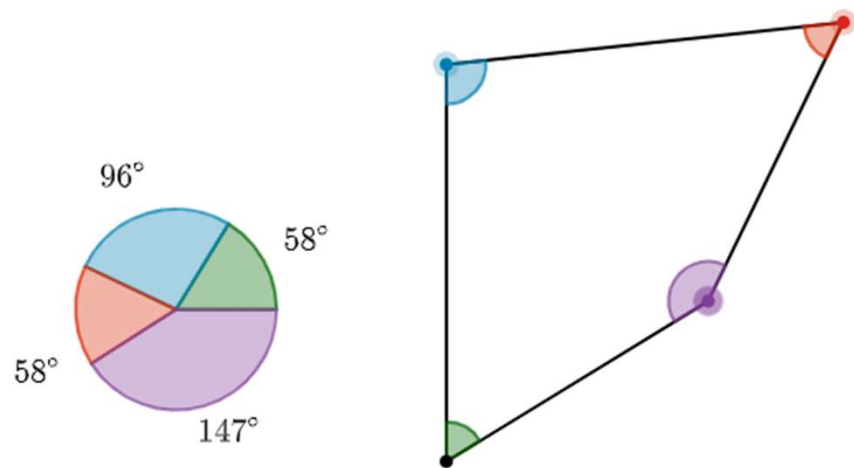
Properties of Quadrilaterals

Figure ABCD is a quadrilateral.
How do we know it is a quadrilateral?

It has 4 sides.

Is having 4 sides a property or attribute of a quadrilateral?

Having 4 sides is a property of quadrilaterals. This is because it is TRUE OF ALL quadrilaterals.



TAKE-AWAY:
The angles in every quadrilateral always add up to 360 degrees. This is a property of quadrilaterals.

Use interactive Geometry World on Digital Great Minds.



LAND (10-min)

Exit Ticket



1

Name _____

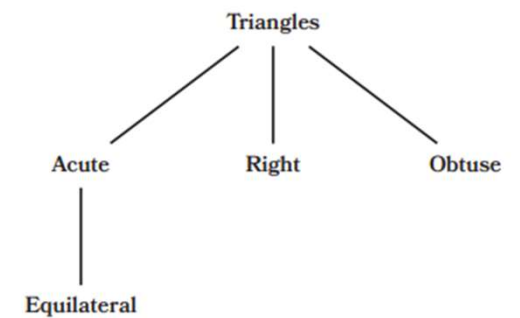
Date _____

1. Consider the hierarchy shown.

a. Are all acute triangles equilateral?

b. Are all equilateral triangles acute?

c. All equilateral triangles have 3 lines of symmetry. Does that mean that all triangles have 3 lines of symmetry? Explain.



2. Name two properties of quadrilaterals.

Exit Ticket – PAGE 11

Small Group Time:

Problem Set Pages 7 - 10

Homework:

Page 9 APPLY BOOK