

# COMMON CORE COLLABORATIVE CARDS

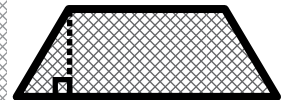
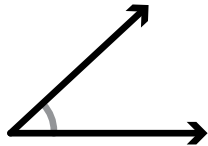
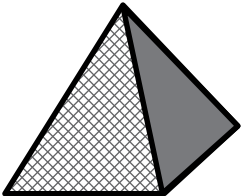


Grades 6–8

Additional resources available at

[didax.com/cccc](http://didax.com/cccc)

TEACHER GUIDE



GEOMETRY

by Kit Norris

## OVERVIEW

Common Core Collaborative Cards support the teaching and learning of mathematics in several ways. They can be used:

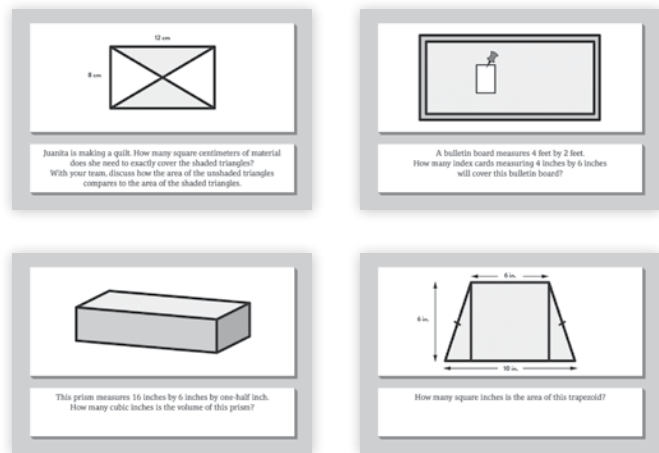
- As an activator for the day's lesson
- To review previous content
- As a learning center activity
- For students' independent practice

Common Core Collaborative Cards provide convenient and motivating ways to place students in collaborative teams for an upcoming unit or problem-solving lesson.

The Common Core Collaborative Cards series consists of three decks of cards per box, each focusing on the same domain in the Common Core State Standards (CCSS). Each deck provides problems representing the standards articulated in the CCSS for a particular grade level.

Teachers using these decks have commented that they have been able to observe what their students understand as well as identify their misconceptions. Teachers have also noted that their students began to rely on each other more instead of seeking out the teacher to answer their questions.

The cards are designed to place students in groups of four. Students are each given a card and asked to solve the problem on it. They then look for three other students who have the same solution. Once they have located their group, the students must be ready to explain why each group member's card belongs in the group. Here is one group of four cards from the Grade 6 Geometry deck:



All four cards in this set have the same answer, 48, so students who receive one of these cards form a group.

## GROUP MEMBER ROLES

The cards offer a second feature: the reverse side of each card indicates the role the student holding the card is to perform in the group. After the students are presented with the task for that day's lesson, each member of the group takes on the role designated. These roles are as follows:

- Discussion Director
- Resource Manager
- Recorder
- Team Captain

Teachers can easily identify the roles that students are expected to perform since students place their cards on their desk with the side indicating the role facing up. The roles are explained as follows:

If you are the **Discussion Director**, your job is to . . .

- Make sure that everyone has read the problem and understands what the question is asking. You can ask, "What do we know?" "What do we want to find out?" and "Can we make a prediction?"
- Invite everyone in the group to participate. You can use statements such as, "What is your idea?" and "What are you thinking?"

If you are the **Resource Manager**, your job is to . . .

- Ask the teacher a question if all of the members of the group have the same question.
- Get any supplies needed by the group.
- Keep track of time.

The Resource Manager's role goes beyond taking care of the supplies. The Resource Manager is the only member of the group who may ask the teacher a question. Before asking a question, every member of the group must have the same question, and the teacher can then direct the answer to the whole group. This helps the members of the group become more interdependent, since group members can answer many of their questions themselves rather than relying on the teacher.

If you are the **Recorder**, your job is to . . .

- Keep track of the thinking of the group. Be ready to answer how the group approached the problem. What strategy did the group use to solve the problem?
- Record the work of the group. Be organized and clear.
- Ask, "Is there anything else we need to include?"

If you are the **Team Captain**, your job is to . . .

- Make sure that everyone in your group can explain to the class the solution and the strategies used to solve the problem.
- Ask each member of your group, “How would you explain what we did to get this answer?” “What questions do you have?”
- Check the group’s solution by asking, “Does our answer make sense?”
- Take on any role if one member of your group is absent.

## MANAGING THE CARDS IN YOUR CLASSROOM

Like any other classroom materials, you’ll need to manage your Common Core Collaborative Cards. It is essential to group the cards by shared answer after each use. Since the cards are designed to place students in groups of four and since class size will vary, this end-of-activity organizational task will make it easier to distribute the cards the next time you use them. Here are some suggestions for organizing the cards after each use:

- As you collect the cards from each student group, place a rubber band around each group of four cards with the same answer before storing.
- After the activity, collect the cards from the class in any order and designate a student to organize the cards into groups of four according to the answer.

## WHAT THE RESEARCH SAYS

Research on the effectiveness of collaborative learning abounds. For more information on the research that informs this product, as well as a complete list of bibliographic references and suggestions for further reading, please visit [didax.com/cccc](http://didax.com/cccc).

## COMMON CORE STATE STANDARDS – MATHEMATICAL PRACTICES

The Common Core State Standards define what mathematically proficient students know and are able to demonstrate. Combining the process standards from NCTM’s Principles and Standards for School Mathematics with the definition of mathematical proficiency from Kilpatrick, Swafford, and Findell’s *Adding It Up: Helping Children Learn Mathematics*, the Common Core Standards present the Mathematical Practices.

These practices focus on the specific actions taken by students who are mathematically proficient.

The eight mathematical practices are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

(*Common Core State Standards for Mathematics*, 2010, pp. 6–8)

The authors of the Common Core carefully chose to begin the mathematical practices with problem solving. “Problem solving is not only a goal of learning mathematics but also a major means of doing so” (NCTM, 2000, p. 52). Students who are engaged in solving meaningful tasks are in the process of building their understanding. They are making connections, constructing arguments, analyzing approaches, looking for patterns, and reflecting on their thinking. These students are learning mathematics, and they have opportunities to exhibit the eight mathematical practices.

The Collaborative Cards provide students with opportunities to develop proficiency in the eight mathematical practices. Students solve problems, discuss strategies, and reason mathematically (Mathematical Practices 1–3). They work with patterns and apply them in various contexts (Mathematical Practices 7–8). They determine whether to calculate problems mentally or use paper and pencil (Mathematical Practice 5). By attending to the use of appropriate vocabulary and the accuracy of their responses, they are attending to precision (Mathematical Practice 6). They use equations to model problem situations (Mathematical Practice 4).

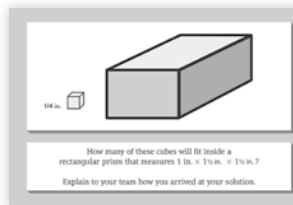
The Collaborative Cards provide teachers with insights into what individual students truly understand. As they apply their knowledge in new contexts, students use what they know. As one teacher in Grafton, Massachusetts stated, “I gained insights into my students’ misconceptions. These cards are an easy way to learn about students’ strengths.”


## GEOMETRY: GRADE 6

The Grade 6 deck focuses on the standards in the Geometry domain as presented in the Common Core State Standards on pages 44–45.

In Grade 5, students graphed points on the coordinate plane to solve real-world and mathematical problems and classified two-dimensional figures into categories based on their properties. In Grade 6, students build on these understandings as they solve real-world and mathematical problems involving area, surface area, and volume. They consider the properties of polygons as they plot vertices on the coordinate plane and then determine the area of the polygon or the length of a side; they work with nets to determine the surface area of figures; and they consider fractional units of length as they calculate the volume of right rectangular prisms.

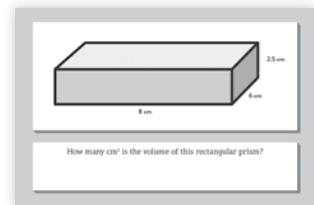
Here is one group of four cards in the Grade 6 deck that all have the same answer, 120.




14 in. 

How many of these cubes will fit inside a rectangular prism that measures 1 in.  $\times$  1 1/2 in.  $\times$  1 1/2 in.?

Explain to your team how you arrived at your solution.

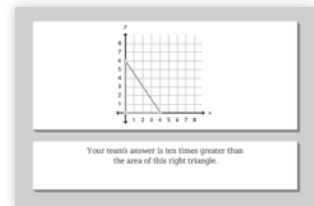


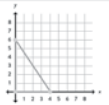


How many  $\text{cm}^3$  is the volume of this rectangular prism?

$0.12\text{L} = \underline{\hspace{2cm}}$

Joe wondered how many milliliters would be the same as 0.12 liters. What answer would you give Joe?





Your team's answer is ten times greater than the area of this right triangle.

In this set of four cards, students find the volume of right rectangular prisms with fractional edge lengths by packing the prism with unit cubes and by using the formula  $V = lwh$ . They also calculate the area of a triangle given its coordinates on the coordinate plane, and draw on their Grade 5 geometric measurement knowledge to convert liters to milliliters.

Answers for Grade 6 Geometry are found on pages 10–12 of this guide.




## GEOMETRY: GRADE 7

The Grade 7 deck focuses on the standards in the Geometry domain as presented in the Common Core State Standards on pages 49–50.


In Grade 7, students extend their understanding from Grade 6 to solve problems involving scale drawings of geometric figures and compute actual lengths and areas from a scale drawing. They also solve real-world and mathematical problems involving angle measure, area, surface area, and volume. They analyze the relationships among angles formed by parallel and perpendicular lines and apply the formulas for the area and circumference of a circle.

Here is one group of four cards in the Grade 7 deck that all have the same answer, 50.

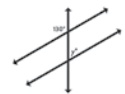


16 ft  
8 ft


Suppose you enlarge this rectangle by a scale factor of 2.5. How many feet will the perimeter of the enlarged rectangle be? (With your team, discuss another way of calculating the perimeter.)



How many degrees does angle  $p$  measure? (Share your thinking with your team.)



Two parallel lines are cut by a transversal. Given that one exterior angle is  $130^\circ$ , how many degrees is angle  $p$ ?



2 cm  
4 cm

This representation of a rectangular yard has been reduced by a scale factor of 2 cm for every 5 m. How many square meters in the area of the yard it represents? (Be ready to justify your thinking to your team.)

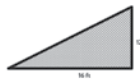
In this set of four cards, students use what they know about supplementary angles to find the unknown angle in a right triangle and in a figure showing two parallel lines cut by a transversal. They also look at diagrams and consider the actual perimeter and area given the scale factor.

Answers for Grade 7 Geometry are found on pages 13–15 of this guide.

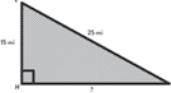
## GEOMETRY: GRADE 8

The Grade 8 deck focuses on the standards in the Geometry domain as presented in the Common Core State Standards on pages 55–56. In Grade 8, students focus on congruency and similarity as experienced through rotations, reflections, translations and dilations. Students also work with the Pythagorean theorem to determine side lengths of right triangles in real-world and mathematical contexts. Students also extend their understanding of volume from earlier grades to work with cones, cylinders and spheres.


Here is a one group of four cards in the Grade 8 deck that all have the same answer, 20.



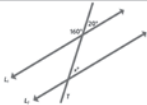
Mark wants to make a sandlot in the shape of a right triangle. One leg of the triangle is 16 feet and the other leg is 12 feet. How many feet will the hypotenuse of the triangle be?



From Sarah's house (H) to the library (L) is 15 miles, and the distance from the library to her school (S) is 25 miles. How many miles is it from Sarah's house to her school?



The area of the base of this right cylinder is 166 square units. The volume of the cylinder is 1003 cubic units. How many units is the height of the cylinder? (Your partners have the same answer rounded to the nearest whole unit.)



$l_1$  is parallel to  $l_2$ , and  $T$  is the transversal forming the angles. How many degrees does  $\angle a$  measure?

In this set of four cards, students apply the Pythagorean theorem to determine the unknown side length in right triangles and find the measurement of an unknown angle based on their knowledge of the angles created when parallel lines are cut by a transversal. They also calculate the height of a cylinder given its volume and the area of its base.

Answers for Grade 8 Geometry are found on pages 16–18 of this guide.



## VISIT DIDAX.COM/CCCC ...

For the following important resources:

- A complete bibliography and links to research that informed this product
- A complete correlation to the Common Core State Standards for each grade-level deck
- Meaningful tasks to be used at each grade level (once students have used the Common Core Collaborative Cards to form their groups)

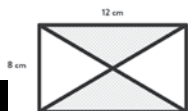
## ADDITIONAL MEANINGFUL TASKS

One of the best sources of meaningful tasks related to the Common Core is the book *NCSM: Great Tasks for Mathematics (K-5)* by Connie Schrock, Kit Norris, David K. Pugalee, Richard Seitz, and Fred Hollingshead. (National Council of Supervisors of Mathematics, 2013, ISBN: 978-0-9890765-0-0.)

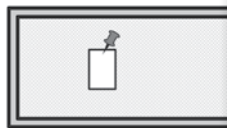
# GRADE 6 GROUPINGS

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccc](http://didax.com/cccc).

**ANSWER  
48**



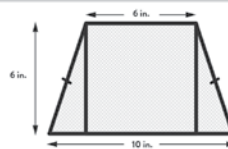
Juanita is making a quilt. How many square centimeters does she need to exactly cover the shaded triangle? With your team, discuss how the area of the unshaded triangle compares to the area of the shaded triangle.



A bulletin board measures 4 feet by 2 feet. How many index cards measuring 4 inches by 2 inches will cover this bulletin board?

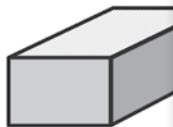


This prism measures 16 inches by 6 inches by 6 inches. How many cubic inches is the volume of this prism?

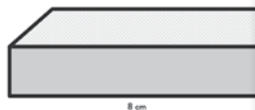


How many square inches is the area of this trapezoid?

**ANSWER  
120**



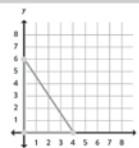
How many of these cubes will fit inside a rectangular prism that measures  $1 \text{ in.} \times 1 \text{ in.} \times 1 \text{ in.}$ ? Explain to your team how you arrived at your answer.



How many  $\text{cm}^3$  is the volume of this rectangular prism?

$$0.12L = \underline{\hspace{2cm}}$$

Jose wondered how many milliliters would be the same as 12 liters. What answer would you give Jose?

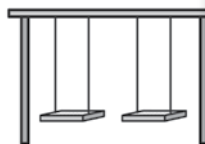


Your team's answer is ten times greater than the area of this right triangle.

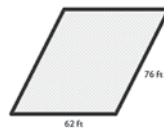
**ANSWER  
276**



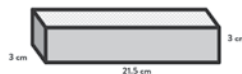
A rectangular pool deck measures 3 feet wider than the swimming pool on all sides. If the pool measures 22 feet by 12 feet, how many square feet is the area of the pool deck?



A rectangular playground has an area of 3588 square yards. The width of the playground is 13 yards. How many yards is the length of the playground?



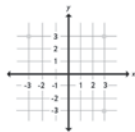
A new puppy's play area is parallelogram-shaped. How many feet of fencing will the puppy's owner need to keep the play area if the play area has the measurements shown?



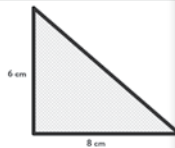
How many cubic centimeters is the surface area of this rectangular prism?

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccs](http://didax.com/cccs).

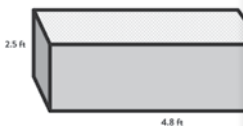
## GRADE 6 GROUPINGS



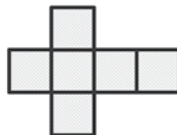
Identify the coordinates of the fourth vertex that creates a square. Your team has the same answer as the perimeter of the square.



How many  $\text{cm}^2$  is the area of this right triangle?

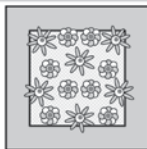


How many cubic feet is the volume of this right prism?

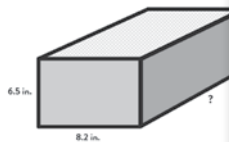


**ANSWER**  
24

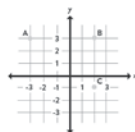
Trina made a net of a cube with 2-in. sides. How many square inches is the surface area of this cube?



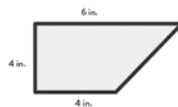
A square garden with sides that measure 4 meters is surrounded by a border that is 1 meter wide. How many square meters is the area of the border? (With your team, discuss another way to find the area.)



The volume of this rectangular prism is  $1066 \text{ cu in.}$  How many inches is its length?

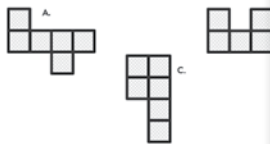


Three sisters live on corners of a rectangular park. Find the distance from Abby's apartment (A) to Betty's house (B). Find the distance from Betty's house to Carrie's apartment (C). How many square units is the area of the park?



**ANSWER**  
20

How many square inches is the area of this right trapezoid? (Be ready to discuss your thinking with your team.)



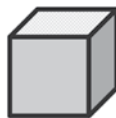
Which of these figures is the net of a cube? (Your partners have the same letter answer as you do.)

- A. The volume is eight times greater.
- B. The volume is twice as big.
- C. The volume is four times greater.
- D. The volume is six times greater.



When you double the length of the side of a cube, how does the volume change? (Your partners have the same letter answer as you do.)

- A:  $\frac{1}{64} \text{ m}^3$
- B:  $\frac{1}{12} \text{ m}$
- C:  $\frac{1}{64} \text{ m}$
- D:  $\frac{1}{16} \text{ m}^3$

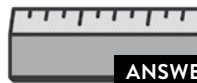


What is the volume of a cube whose side measures  $\frac{1}{4} \text{ m}$ ? (Your partners have the same letter answer as you do.)

- A: 1728
- B: 164
- C: 36
- D: 1440

**ANSWER**  
A

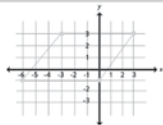
How many cubic inches are in one cubic foot? (Your partners have the same letter answer as you do.)



# GRADE 6 GROUPINGS

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/ccc](http://didax.com/ccc).

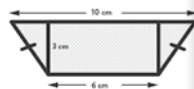
**ANSWER  
C**



What is the correct value for the area of this parallelogram?  
(Your partners have the same letter answer as you do.)

- A: All faces are squares.  
B: One face is a square; the other faces are triangles.  
C: All faces are triangles.  
D: One face is a rectangle; the other faces are squares.

One of these statements describes the faces of a cube.  
Select the true statement.  
(Your partners have the same letter answer as you do.)



- A: 19 cm<sup>2</sup>  
B: 30 cm<sup>2</sup>  
C: 24 cm<sup>2</sup>  
D: 18 cm<sup>2</sup>

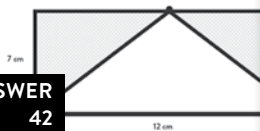
Select the correct value for the area of this isosceles trapezoid.  
(Your partners have the same letter answer as you do.)



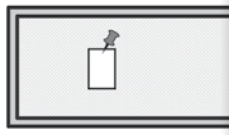
- A: 40 in.<sup>2</sup>  
B: 30 in.<sup>2</sup>  
C: 24 in.<sup>2</sup>  
D: 48 in.<sup>2</sup>

Select the correct value for the area of this right triangle.  
(Your partners have the same letter answer as you do.)

**ANSWER  
42**



The white region represents an isosceles triangle.  
How many square centimeters is the area of the shaded region?  
(Be ready to explain your thinking to your partners.)



My teacher's bulletin board measures 1008 square inches.  
She wants to cover her board with 4 in.  $\times$  6 in. index cards.  
How many index cards will she need?



A rectangular prism has a length of 10 in., a width of 1 in., and a height of 1 in.  
What is its surface area in square inches?

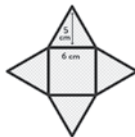


An equilateral triangle has a side length of 7. If the length of each side of the triangle is doubled, how many units will the perimeter of the new triangle be?

**ANSWER  
D**

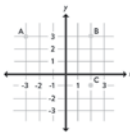


This is the net of a cube with sides that measure 3 units.  
What is the surface area of this cube?  
(Your partners have the same letter answer as you do.)



- A: 156 cm<sup>2</sup>  
B: 82 cm<sup>2</sup>  
C: 48 cm<sup>2</sup>  
D: 96 cm<sup>2</sup>

Here is the net of a square pyramid. What is its surface area?  
(Your partners have the same letter answer as you do.)



- A: 48 square units  
B: 45 square units  
C: 63 square units  
D: 20 square units

Find the fourth vertex that creates a rectangle.  
What value represents the area of the rectangle?  
(Your partners have the same letter answer as you do.)

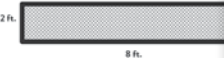
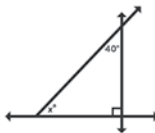
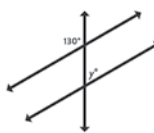
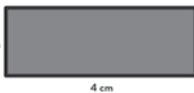

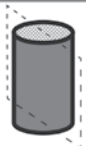
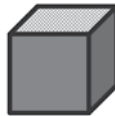
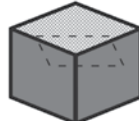
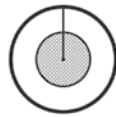
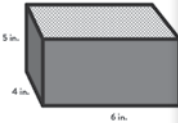
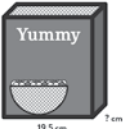
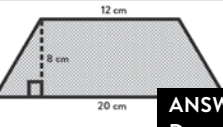


- A: 900 cubic units  
B: 1000 cubic units  
C: 890 cubic units  
D: 891 cubic units

This box measures  $9 \times 9 \times 11$  units.  
How many cubic units will it take to completely fill the box?  
(Your partners have the same letter answer as you do.)

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccs](http://didax.com/cccs).

## GRADE 7 GROUPINGS

			
<p>Suppose you enlarge this rectangle by a scale factor of 3. How many feet will the perimeter of the enlarged rectangle be?</p> <p>(With your team, discuss another way of calculating the perimeter.)</p>	<p>How many degrees does angle <math>x</math> measure?</p> <p>(Share your thinking with your team.)</p>	<p>Two parallel lines are cut by a transversal. Given that the top-left angle is <math>130^\circ</math>, how many degrees is angle <math>x</math>?</p>	<p>This representation of a rectangular yard has been reduced by a scale factor of 2 cm for every 5 m. How many square meters is the area of the yard it represents? (Be ready to justify your thinking to your team.)</p>
<p>A: 14 cm, 8 cm, 3 cm B: 6 cm, 6 cm, 6 cm C: 9 ft, 8 ft, 1 ft D: 5 mm, 8 mm, 2 mm</p> 	<p>A: Circle B: Rectangle C: Rhombus D: Square</p> 	<p>A: <math>216 \text{ in.}^3</math> B: <math>27 \text{ in.}^3</math> C: <math>64 \text{ in.}^3</math> D: <math>81 \text{ in.}^3</math></p> 	<p>A: Rectangle B: Triangle C: Parallelogram D: Trapezoid</p> 
<p>Which group of 3 lengths can be used to form a triangle?</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>If you slice this cylinder in half from top to bottom, what shape will the resulting cross-section be?</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>This cube has a surface area of 54 square inches. Select the value that represents its volume.</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>If we cut a corner off this cube, what shape will the resulting cross-section be?</p> <p>(Your partners have the same letter answer as you do.)</p>
<p>A: 25 square inches B: 50π square inches C: 15π square inches D: 25π square inches</p> 	<p>A: <math>104 \text{ in.}^2</math> B: <math>178 \text{ in.}^2</math> C: <math>120 \text{ in.}^2</math> D: <math>148 \text{ in.}^2</math></p> 	<p>A: 18 cm B: 40 cm C: 15 cm D: 5 cm</p> 	<p>A: Area = <math>12 \times 8 = 20 \text{ cm}^2</math> B: Area = <math>\frac{1}{2}(8)(20) \text{ cm}^2</math> C: Area = <math>12 \times 8 \text{ cm}^2</math> D: Area = <math>\frac{1}{2}(8)(8) + 8(2) \text{ cm}^2</math></p> 
<p>The radius of the larger circle is 10 in. The radius of the smaller circle is 5 in. How many square inches is the area of the shaded region?</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>Cordelia is wrapping a present. Find the surface area of the box she can be sure to cut a big enough piece off the roll of paper.</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>The volume of this cereal box is about 241.5 cm<sup>3</sup>. The height and width of the box are shown. What is a close estimate of the depth of the box?</p> <p>(Your partners have the same letter answer as you do.)</p>	<p>Felipe wants to find the area of this trapezoid. Which formula will yield the correct answer?</p> <p>(Your partners have the same letter answer as you do.)</p>

ANSWER  
50

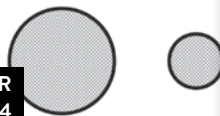
ANSWER  
B

ANSWER  
D

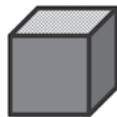
# GRADE 7 GROUPINGS

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccc](http://didax.com/cccc).

**ANSWER  
4**



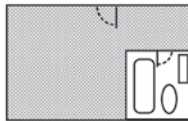
The diameter of the larger circle is twice as long as the diameter of the smaller circle. How many times bigger is the area of the larger circle?



The volume of this cube is 64 cubic inches. Find the length of the side in inches. (Be ready to share your thinking with your team.)

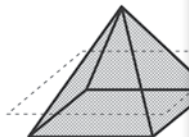


The side of the larger square measures twice as long as the side of the smaller square. How many times bigger is the area of the larger square than the smaller square? (Be ready to justify your thinking to your team.)

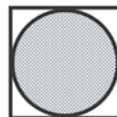


On the architect's plan, 2 cm represents 5 feet. If the actual measurement of the width of a room is 10 feet, how many centimeters wide is the room on the architect's plan?

**ANSWER  
C**



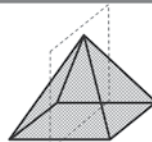
Suppose you cut through this square pyramid parallel to the base. What shape would the resulting cross-section be? (Your partners have the same letter answer as you.)



- A: 75 square inches
- B: 100 square inches
- C: 21 square inches
- D: 10 square inches

A circle with a 10-in. diameter is cut from a square whose side length is 10 inches. How much paper will be left over after you finish cutting? Round your answer to the nearest whole number. (Your partners have the same letter answer as you.)

- A: Square
- B: Rectangle
- C: Triangle
- D: Rhombus



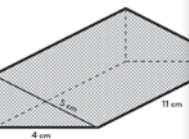
A vertical slice is cut through this pyramid starting at the top vertex and perpendicular to the base. What shape was the resulting cross-section? (Your partners have the same letter answer as you.)

- A:  $5.4 + 4.2 + 4.2 + 8.4 + 4.2 + 4.2 + 5.4 + 5.4 + 8.4 + 5.4$
- B:  $0.5(3.5)(6.2) + (8.4)(4.2)$
- C:  $(3.5)(6.2) + (8.4)(4.2) + (8.4)(6.4)$
- D:  $(3.5)(6.2) + (8.4)(4.2) + (5.4)(8.4) + (8.4)(6.2)$

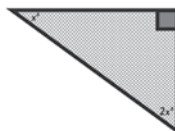


Select the expression that correctly represents the surface area of this triangular prism. (Your partners have the same letter answer as you do.)

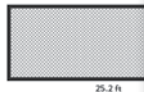
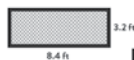
**ANSWER  
3**



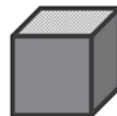
The volume of this right triangular prism is 220 cubic centimeters. How many centimeters is the height of the prism?



Find the value of  $x$  given the information above. Your team's answer is your result divided by 2.



The rectangle on the left was enlarged to create the rectangle on the right. What was the scale factor used?

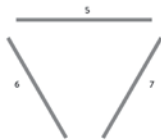


The surface area of this cube is 54  $\text{cm}^2$ . How many centimeters is the length of the side of the cube? (Be ready to share your thinking with your team.)



Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccs](http://didax.com/cccs).

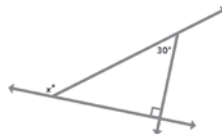
## GRADE 7 GROUPINGS



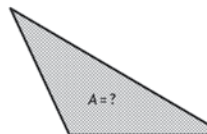
Rafe thinks these three lines will form a triangle.  
Do you agree with Rafe? (Answer "Yes" or "No")  
(Be ready to explain your thinking.)



Sally says the volume of a triangular prism can be calculated by multiplying the area of the base by the height of the prism.  
(Answer "Yes" or "No")  
(Be ready to explain your thinking.)



Ashton looked at the above figure and said that angle  $x$  must measure 60 degrees.  
Do you agree with him? (Answer "Yes" or "No")  
(Be ready to explain your thinking.)

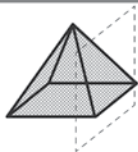


**ANSWER**  
yes

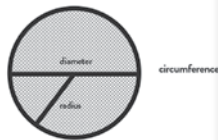
Celia says that the area of a triangle is always  $\frac{1}{2}$  the length of the base times the height. She justifies her thinking by saying, "Any triangle is half of a parallelogram."  
Do you agree with Celia's argument? (Answer "Yes" or "No.")



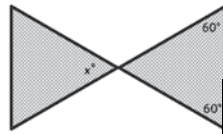
Marie says a triangle can have more than one obtuse angle.  
Do you agree? Answer "Yes" or "No."  
(With your partners, discuss why or why not.)



Edwin cut through a square pyramid like this. He says the cross-section will be in the shape of a triangle.  
Do you agree with Edwin? Answer "Yes" or "No."  
(With your partners, discuss why or why not.)

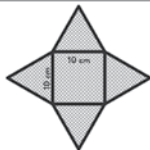


Katherine says that the way to find the circumference of a circle is to multiply the radius by  $\pi$ . Do you agree with her?  
(Answer "Yes" or "No.")  
(With your partners, discuss why or why not.)

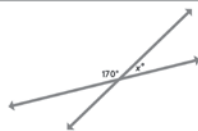


**ANSWER**  
no

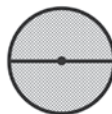
Rashawn says that angle  $x$  must measure 120 degrees.  
Do you agree? (Answer "Yes" or "No.")  
(With your partners, discuss why or why not.)



The surface area of a square pyramid is 300 square centimeters.  
How many centimeters is the height of the pyramid?



Given these intersecting lines, how many degrees does angle  $x$  measure?



The area of a circle is 78.5 square meters.  
How many meters is its diameter rounded to the nearest whole number?



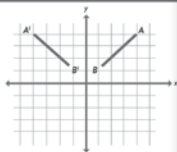
**ANSWER**  
10

Peter presents a puzzle: The length of a rectangle is twice as long as the width. The perimeter of this rectangle is 30 cm. The area is 50 square centimeters.  
How many centimeters is the length of the rectangle?

# GRADE 8 GROUPINGS

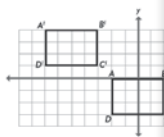
Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/ccc](http://didax.com/ccc).

ANSWER  
B

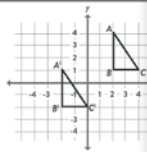


- A: Dilation
- B: Translation
- C: Reflection
- D: Rotation

What letter choice best describes the rigid transformation shown in this diagram? (Your partners have the same letter answer as you do.)

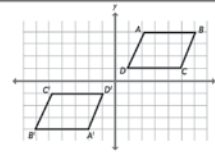


Look at this diagram and identify the type of rigid transformation it shows. (Your partners have the same letter answer as you do.)



- A: Move right 4 and up 3
- B: Move left 4 and down 3
- C: Move right 3 and down 4
- D: Move left 3 and up 4

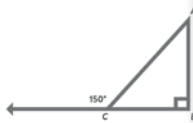
Triangle  $ABC$  has been translated to triangle  $A'B'C'$ . Select the steps that describe this translation. (Your partners have the same letter answer as you do.)



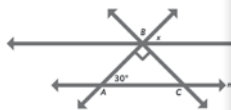
- A: Reflection over  $x$ -axis
- B: Rotation clockwise 180 degrees
- C: Reflection over  $y$ -axis
- D: Rotation clockwise 90 degrees

Select the best description of steps taken to transform the pre-image,  $ABCD$ , to the image,  $A'B'C'D'$ . (Your partners have the same letter answer as you do.)

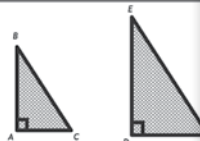
ANSWER  
30



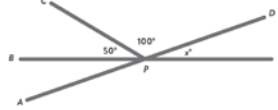
How many degrees does  $\angle ACB$  measure?



Use the diagram to determine the number of degrees  $x$  measures. (Triangle  $ABC$  is a right triangle and  $l$  is parallel to  $m$ .) (Be ready to explain your thinking to your group.)

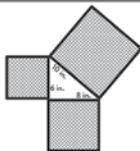


Identify the number of degrees in  $\angle DEF$  given that  $m\angle ABC = 30^\circ$  and  $\triangle ABC$  is similar to  $\triangle DEF$ . (Be ready to share your thinking with your group.)

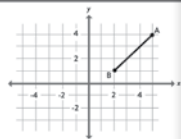


$\overline{BE}$  intersects  $\overline{AD}$  at  $P$ . How many degrees does angle  $x$  measure?

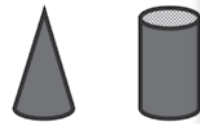
ANSWER  
yes



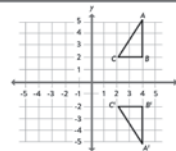
Robert says he can prove a triangle is a right triangle by drawing a square on each side of the triangle and calculating the area of each square. Do you agree? (Answer "Yes" or "No." Be ready to explain your thinking to your group.)



Jo says that she can use the Pythagorean theorem to determine the length of the line segment  $AB$ . Is she right? (Answer "Yes" or "No." Then discuss with your partners.)



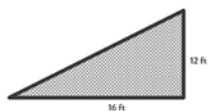
Mary Ann says that the volume of the cone is  $1/3$  of the volume of the cylinder. The two figures have the same height and the same radius. Do you agree with Mary Ann? (Answer "Yes" or "No." Then discuss with your partners.)



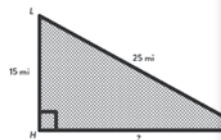
Manuel says that when a figure is reflected over the  $x$ -axis, the signs of the  $y$ -coordinates are the opposites of the signs of the  $y$ -coordinates in the pre-image. Is Manuel right? (Answer "Yes" or "No." Be ready to explain your thinking to your group.)

Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/cccs](http://didax.com/cccs).

## GRADE 8 GROUPINGS



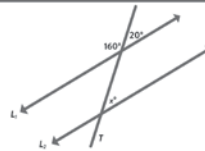
Mark wants to make a sandbox in the shape of a right triangle. One leg of the triangle is 16 feet and the other leg is 12 feet. How many feet will the hypotenuse of the triangle be?



From Sara's house ( $H$ ) to the library ( $L$ ) is 15 miles and the distance from the library to her school ( $S$ ) is 25 miles. How many miles is it from Sara's house to her school?

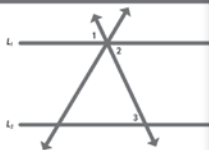


The area of the base of this right cylinder is  $16\pi$  square units. The volume of the cylinder is  $100\pi$  cubic units. How many units is the height of the cylinder? (Your partners have the same answer rounded to the nearest whole number.)

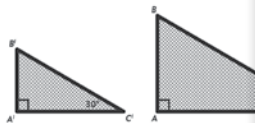


$L_1$  is parallel to  $L_2$  and  $T$  is the transversal forming the angles. How many degrees does  $\angle x$  measure?

**ANSWER**  
20



$L_1$  is parallel to  $L_2$  and  $\angle 1$  measures  $60^\circ$ . How many degrees does  $\angle 3$  measure?



These two triangles are similar. How many degrees does  $\angle ABC$  measure?



A fire has started on the roof of an 80-ft tall building. How many feet away from the building should the top of the fire truck's 100-ft ladder be placed so that the ladder will reach the roof of the building?



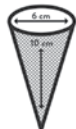
How many degrees does  $\angle x$  measure?

**ANSWER**  
60



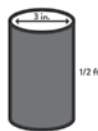
- A. The volume of the cone is  $\frac{1}{3}$  the volume of the cylinder.
- B. The volume of the cylinder is twice the volume of the cone.
- C. The volume of the cone is  $\frac{1}{4}$  the volume of the cylinder.
- D. The volume of the cone is  $\frac{2}{3}$  of the volume of the cylinder.

Select the true statement. Assume that the cone and cylinder are equal in height and have bases that are equal in area. (Your partners have the same letter answer as you do.)



- A.  $30\pi$  cm<sup>3</sup>
- B.  $60\pi$  cm<sup>3</sup>
- C.  $90\pi$  cm<sup>3</sup>
- D.  $20\pi$  cm<sup>3</sup>

What volume of water will fill this cone to the top if it is inverted? (Your partners have the same letter answer as you do.)



- A.  $13.5\pi$
- B.  $13\pi$
- C.  $54\pi$
- D.  $18\pi$

Select the answer that best represents the volume of the cylinder. (Your partners have the same letter answer as you do.)



- A.  $143\pi$  in.<sup>3</sup>
- B.  $30\pi$  in.<sup>3</sup>
- C.  $120\pi$  in.<sup>3</sup>
- D.  $1000\pi$  in.<sup>3</sup>

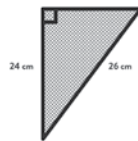
The diameter of this basketball is 9.5 inches. Select the answer that best approximates its volume. (Your partners have the same letter answer as you do.)

**ANSWER**  
A

# GRADE 8 GROUPINGS

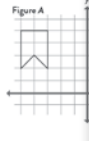
Correlation to the Common Core State Standards for each group of 4 cards can be found at [didax.com/ccc](http://didax.com/ccc).

**ANSWER**  
**C**



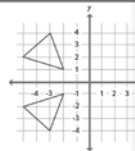
What is the length of the shorter leg of the right triangle?  
(Your partners have the same letter answer as you do.)

- A: Translated Figure A.  
B: Rotated Figure A 180° around origin.  
C: Rotated Figure A 90° around origin.  
D: Reflected Figure A across the y-axis.

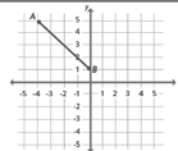


Select the statement that describes this rigid transformation.  
(Your partners have the same letter answer as you do.)

- A: Rotation  
B: Reflection over the y-axis  
C: Reflection over the x-axis  
D: Translation



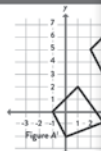
Select the answer that best describes the transformation.



Based on the information given in the graph, select the answer that represents the length of  $\overline{AB}$ .  
(Your partners have the same letter answer you do.)

- A: 4 units  
B: 32 units  
C:  $\sqrt{32}$  units  
D: 12 units

**ANSWER**  
**D**



- A: No, because the angle measures vary.  
B: Yes, because Figure A was rotated 90°.  
C: Yes, because Figure A was translated 4 units left and 3 units down.  
D: Yes, because Figure A was translated 4 units left and 5 units down.

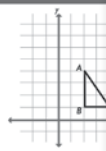
Is Figure A' similar to Figure A?  
(Your partners have the same letter answer as you do.)

- A: ABCDE was reflected over the x-axis to get A'B'C'D'E'.  
B: ABCDE was rotated 90° clockwise around the origin.  
C: The x- and y-coordinates of ABCDE were changed to the opposite signs to yield A'B'C'D'E'.  
D: 7 was subtracted from each y-coordinate of ABCDE to yield A'B'C'D'E'.



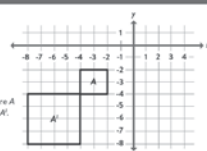
Look at the rigid transformation in the diagram and select the true statement about it.  
(Your partners have the same letter answer as you do.)

- A:  $\triangle ABC \cong \triangle A'B'C'$   
B: The scale factor for this dilation is 5.  
C:  $\angle BAC \cong \angle B'A'C'$   
D: The scale factor of this dilation is 2.



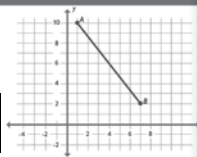
Look at the diagram and select the true statement about the dilation it represents.  
(Your partners have the same letter answer as you do.)

- A: Figure A and A' are similar.  
B: The coordinates of the points in Figure A have been doubled to create Figure A'.  
C: The scale factor of this dilation is 2.  
D: The scale factor of this dilation is 5.

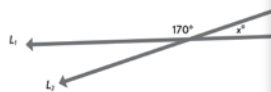


Look at the diagram and select the one false statement about it.  
(Your partners have the same letter answer as you do.)

**ANSWER**  
**10**



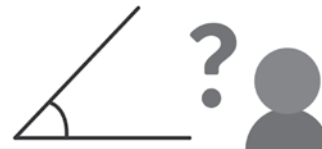
Find the length of  $\overline{AB}$ .  
(Be ready to explain your thinking to your partners.)



Your team has the same value as the number of degrees in angle x.  
(Discuss with your team the definition of opposite and complementary angles.)



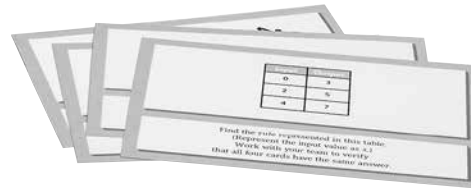
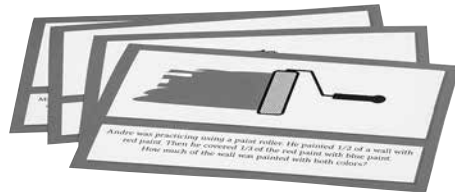
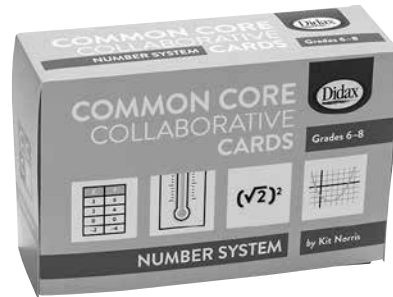
How many degrees does angle x measure?  
Your team's answer is one-half of this value.



Two angles are complementary. If I add 30° to the smaller angle and subtract 40° from the larger angle, the two angles have the same measure. Find the number of degrees in the smaller angle.

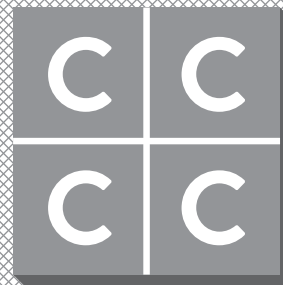
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Common Core  
Collaborative Cards  
available, visit:

[didax.com/cards](http://didax.com/cards)



# GEOMETRY

# TEACHER GUIDE



Practice and reinforce the content from the Common Core State Standards with these innovative activity cards.

Created using the standards in the Geometry domain, these cards actively engage students in problem solving and promote mathematical discussion. Students solve the question on their individual card and then look for others who have the same solution. The four students holding cards with the same answer form a group; the back of their cards show the role that each student will play as the group works on the next task. Based on the most recent research about the effectiveness of collaborative learning, and in accordance with the Common Core Mathematical Practices, these card sets can be used repeatedly to group students for an upcoming unit or problem-solving lesson. Cards can also be used for small-group instruction or as an independent activity. Each set includes 40 durable, two-color cards per grade level for a total of 120 cards. (Each grade-level deck includes four blank cards for teachers to create their own content.) Teacher Guide includes suggestions for classroom use, activities, and access to website with additional tasks and resources.



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