Math Flash Cards
Grade 3

These flash cards were designed with several purposes in mind:

- Provide a **quick review** of key mathematical topics in a fun, fast, frequent, spaced and mixed manner.

- Help students become **familiar with the kinds of graphics/pictures**, **questions**, and **vocabulary** that they see frequently and need to know in math.

- Help students prepare for both **lower level** (recall) and **higher level questions** (compare, analyze, apply, generalize) by practicing these questions sequentially.

- Allow students to **emphasize on process** over computing so they can practice many kinds of questions in the form: explain how *you would find…*

- **Build reading skills** by asking students to slow down and preview a question before starting, asking: "What do I know here?". Next, they find key information in the graphs, titles, and sentences which set the context of the problem.

- Help **students to show work** by modeling a condensed but clear explanation.

- Allow students to **practice skills and recall key concepts** independently or with a partner, a teacher, tutor, aid or parent.

- **Make students aware of mistakes to avoid and look for common errors.**

- Help teachers to assign a **quick homework:** "study these 3 flash cards," and **offer a quick assessment**: "fill in these 4 sections from the flash cards."

- **Challenge each student at their level** by giving opportunities to create their own problems or try problems from another grade level.

Using the Flash Cards

1. **Have students quiz each other**. One student simply folds back the question/answer section and looks at the picture while the other student quizzes him/her. Model this for students. When finished, switch places and repeat. Students should get really fast!

2. Have an teacher's aid, classroom assistant, or student teacher **work with students in small group sessions or one on one**. Some classroom helpers feel less secure with math and often need the support of the answers and this sheet provides them.

3. **Teacher puts a graphic up on the screen and "peppers" the students** with questions from the cards (see *Teach Like a Champion* for more information on Pepper). You can differentiate as you see fit.

4. **Teacher can call individual students** to his or her desk to check for understanding of a card.

5. **Have students practice with them at home** by themselves (by covering one side) or with parents, older siblings, grandparents etc.

6. After encouraging students to "study/review" their cards, clear off the answer side and **give it as a quiz**. You may eliminate some of the questions to make more room for answers. And you can change the questions slightly to avoid a simple "regurgitation" of a memorized answer.

7. Provide the graphic and have **students make up questions** and answers for each picture.

A teacher from Amesbury, Massachusetts writes:

The flashcards are going very well. I give them flash card each night for homework and tell them that they have to "own it" for baby quiz the following day. It is good because it's not too big of an assignment. I see kids quizzing each other, and it really helps to reinforce important facts. For the quick quiz, I don't make them regurgitate it; I ask them to do something that parallels the flashcard.

Remember the cards are a flexible tool and you can adjust them as needed. They are not meant to discourage students from writing down or showing their work; rather they are a quick way to verbally review lots of content easily and painlessly.

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thebillatwood@gmail.com

Lemov, Doug (2010)*Teach Like a Champion.* San Francisco, Jossey-Bass Teacher

6,091

6,901
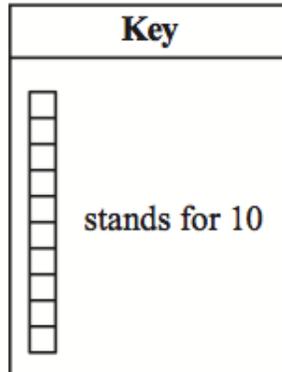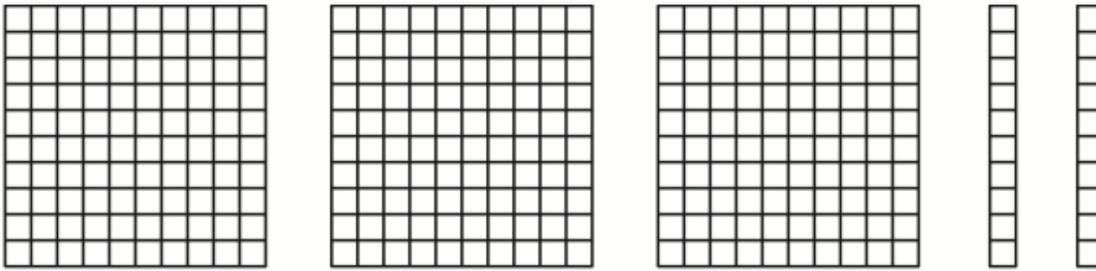
Questions	Answers
Which number is greater? Why?	6,901. It has more hundreds (9 hundreds compared to 0 hundreds)
About how much greater is 6,901 than 6,091?	9 hundred more
What digit is in the thousands place?	6
Can you expand the bottom number?	6,000 + 900 + 1
Estimate the sum of these numbers.	13,000 (13 thousand)
If you rearranged these numbers (6,901) , what is the largest number you could make?	9,610

$$\begin{array}{r} 400 \\ - \underline{296} \end{array}$$

Questions	Answers
What is going to be tricky about this problem?	You will have to re-name or make a trade before you subtract.
Could you solve this problem by adding up?	Yes, add 4 to 296 = 300 then add 100. 104 is the answer.
What would a good estimate be for this problem?	400 – 300 = 100
If a student gave an answer of 296, what mistake are they making?	They are not renaming the top numbers. 0-4 does not = 4
Finish the word problem to match the operation above. The town was 400 miles away. We had driven 296 miles so far.	How much farther did we have to drive?
Finish the word problem: I had 400 pennies in my piggy bank.	I spent 296 pennies. How much left?

Key

 stands for 10

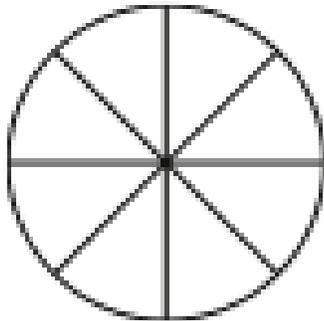| Questions	Answers
What is shown here?	Base ten blocks. 100's and 10's
What does the key show?	One rod stands for 10
What number is shown with the flats and the rods?	320
How many hundreds are there?	3 hundreds
How many tens?	2 tens
If you broke the flat 100's into tens, how many tens would there be in all?	10 + 10 + 10 + 2 = 32 tens
How many tens would you need to make 400?	8 more tens (80)
How many 100's and 10's would you need to add to sum to 1,000?	8 tens (makes a hundred) then 6 hundreds would make 1000 6 hundred and 8 tens = 680

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Questions	**Answers**
What is this picture showing? What multiples are shaded?	This is a hundreds chart. It shows the multiples of 9.
What are two patterns you see with the shaded numbers?	It goes diagonally. Except the first one, of the multiples have 2 digits. The digits add up to 9.
If you put your fingers on 56 and moved down two rows, what number would you be on?	76
If you were on 78 and went down 2 and right 1, where would you be?	99
I went down 2 rows and right 2 columns. I landed on 36. Where did I start?	Go backwards. Up two 16 and left 2, 14 I started on 14. Check it! 14 down 2 right 2 = 36!

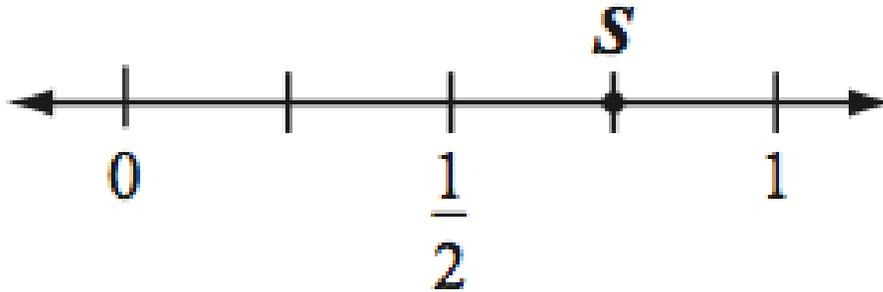James and Noah will paint the circle shown below.

- First, James will paint $\frac{2}{8}$ of the circle.
- Then, Noah will paint another $\frac{3}{8}$ of the circle.

Questions	Answers
Who and what is this about?	James and Noah painting a circle.
What 2 questions do you think they will ask?	How much painted in all? How much left to paint?
What are the key details?	James painted 2/8 Noah painted another 3/8
How many 8ths in a whole?	8/8 makes a whole
How much is left to paint?	2/8 + 3/8 = 5/8 5/8 + 3/8 = 8/8 3/8 left to paint

The number line shows points at 0, 1/2, and 1, with S marked at approximately 3/4.

Questions	Answers
Where is S on the number line?	¾
How far away from 1 is the S?	¼ away
If you wanted to put a T on the line at ¼ point to where it would go?	Between 0 and ½
If S moved over 2 fourths to the right, where would it be?	1 and ¼
If this number line was really a map where 0 was the starting place and 1 was 100 miles away. How many miles away would the S be from 1?	75 miles away each ¼ is 25 25, 50, 75
Is S closer to 1 or 0 or 2? Where does it round to?	1
George said that S is really at 6/8 is he right?	Yes, in a way he is right. 6 out of 8 is the same as 3 out of 4 6/8 = 3/4
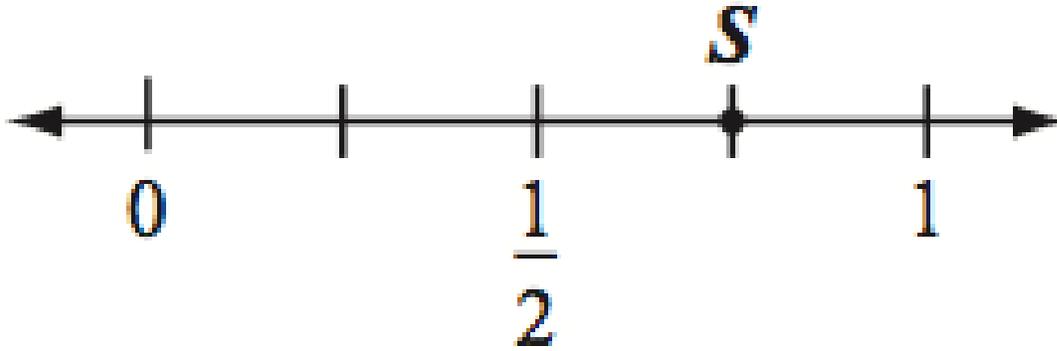
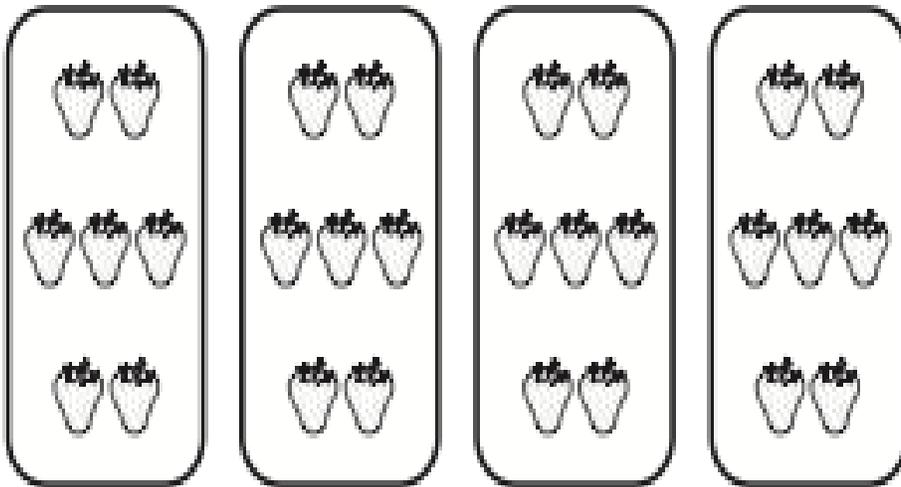| Questions	Answers
What is the picture showing?	A number line
How many parts is the number line divided into?	4 parts
What would each part be called if you used fractions?	Fourths 1/4; 2/4; 3/4; 4/4
What fraction could be used to describe where S is?	¾ Three fourths
What is another name for ½ on this number line?	2/4
If the line continued to the right, what fraction would be next?	1 and ¼
How far from 1 whole is the S?	¼ away
If you were on the number line, exactly between the 0 and ½, where would you be?	1/4

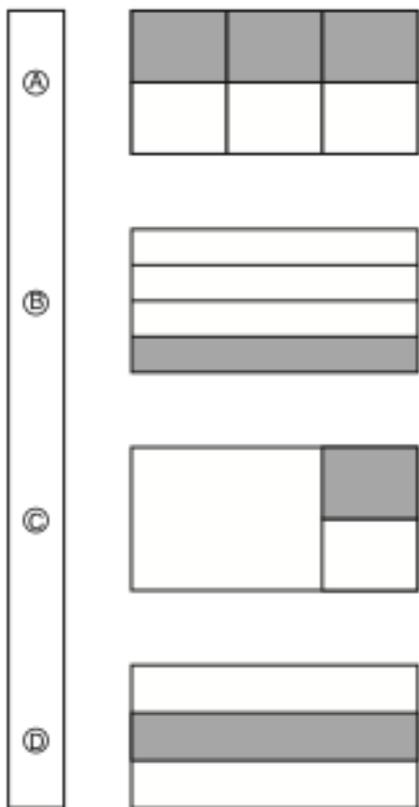**9** Yesterday, the Pizza Palace sold 120 sodas. Today it sold 94 sodas.

How many fewer sodas did the Pizza Palace sell today than it sold yesterday?

Questions	Answers
What multiplication problem is this?	7 x 4
How do you know this is 7 x 4?	Four groups of 7
What is 7 x 4 =	28
What would you have to draw to show 7 x 5?	One more group of 7 strawberries
If I wanted to draw strawberries to show 5 x 8. What would I draw?	5 groups of 8 or 8 groups of 5

Questions	**Answers**
Which shows 1/3?	D
Which shows ½	A
Which shows ¼	B
About how much is shaded in C?	1/6
If A was a candy bar that cost $1.00. How much would the shaded part cost?	$0.50 50 cents
Some students think that A is 1/3 Can you explain why that is wrong?	A is ½ because it's divided into six parts and 3/6 are shaded. That's equal to ½.

Ms. Fisher needs to order rulers for the
24 students in her class.

- Each student needs one ruler.
- Rulers come in boxes of 8.

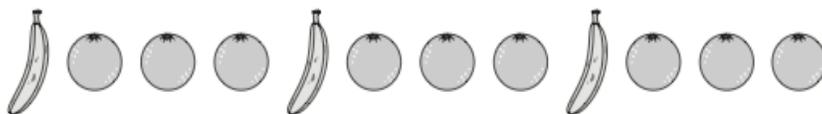| Questions	Answers
Who and what is this about?	Ms. Fisher and ordering rulers
What are the details?	24 students, each needs a ruler Rulers come in boxes of 8
What is likely to be asked?	How many boxes to order
How would you figure out how many boxes to order?	$24 \div 8 = 3$ boxes $8 + 8 + 8 = 24$ 3 boxes
If the rules cost $2 per box, how much would she spend for 3 boxes?	$2 \times 3 = \$6$
Ms. Fisher had a class last year. She had to order 4 boxes of rulers—one for each student. How many kids were in here class last year?	4 boxes of rules x 8 rulers per box. 32 rulers. 32 kids?

Rita wrote the number pattern shown below.

$$57, \quad 53, \quad 49, \quad 45, \quad 41$$

Questions	Answers
Who and what is this problem about?	Rita and her number pattern
What is happening with this pattern?	Going down by 4 each time
What questions will likely be asked?	What comes next? What is the pattern.
What comes next in her pattern?	41 -4 = 37
Rita wrote another pattern: 4, 8, 12, 16… What pattern is this?	Add 4 The multiples of 4
In her multiples of 4 pattern, if she keeps going on numbers will she eventually get to the number 36? Why or why not? How long until she gets there?	Yes, because 4 x 9 = 36 She will say it after 9 numbers.

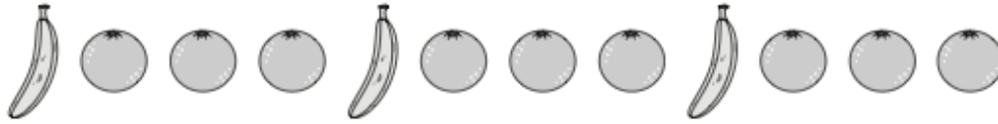Zoey is using bananas and oranges to make the pattern shown below. The rule for her pattern is ABBB.

Zoey will follow the rule for her pattern a total of 4 times.

Questions	Answers
Who and what is this about?	Zoey and her pattern of oranges and bananas
What are the details?	It's an ABBB pattern She makes her pattern 4 times
What will you likely be asked?	Continue the pattern How many bananas in 4 times? How many oranges in 4 times
What does ABBB mean?	It goes A then 3 Bs and then it repeats. 1 thing then 3 of something new then repeat
What if she used bananas and oranges but used a AB pattern. What would it look like?	Banana, orange, banana, orange, banana, orange
What pattern (ABBA or ABBB or …) is this banana, banana, banana, orange; banana, banana, banana, orange…	AAAB pattern

Zoey is using bananas and oranges to make the pattern shown below. The rule for her pattern is ABBB.

Zoey will follow the rule for her pattern a total of 4 times.

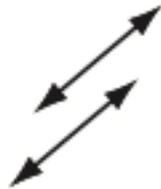| Questions	Answers
Who and what is the problem about?	Zoey is making a pattern with bananas and oranges.
What is her rule? What does this mean?	ABBB means after the first item, the second item repeats three times.
According to the problem, how many times will Zoey repeat her pattern?	Four times.
What will come next in Zoey's pattern?	A banana
How many times has Zoey repeated the pattern so far?	3 times
If Zoey repeats her pattern 4 times, how many oranges will she use?	Orange is repeated 3 times in 1 pattern. 4 patterns means 3 x 4 = 12 12 oranges will be used.
What are good strategies for this problem?	Look for patterns, draw it out, use a number sentence, show your work.
What is another pattern besides ABBB that you could make?	AABB AAAB AB...
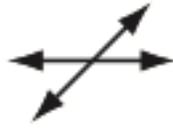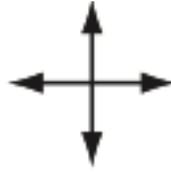
J   K   L

M   N   O

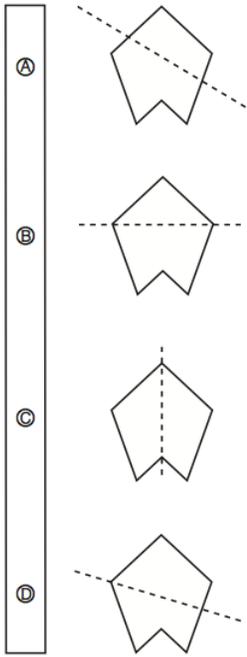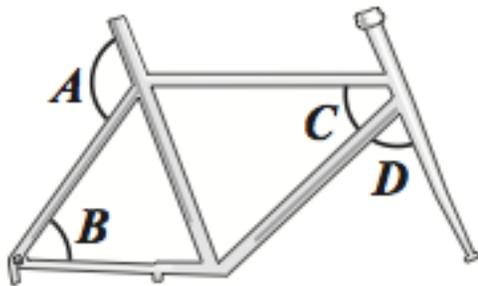| Questions	Answers
1. What does parallel mean and which two letters show parallel lines?	Parallel means never cross. Letters J and N show parallel lines
2. What does intersect mean? Which letters show intersecting lines?	Intersect means to cross. K, L, M and O all show intersecting lines.
3. What does perpendicular mean? Which letters show perpendicular lines?	Perpendicular means to cross at a right angle (like an L) L and O appear to be perpendicular.
4. Give an example of parallel and perpendicular lines in real life.	Parallel lines = train tracks, Parallel = opposite sides of rectangle. Perpendicular would be like a cross or where the wall meets the floor.

Questions	Answers
Questions	**Answers**
What is this problem probably going to ask?	Which shows a line of symmetry?
What is a line of symmetry?	A line that divides a shape into two exact mirror images.
What could you do to see if something had a line of symmetry?	You could imagine folding it. It has to match up perfectly.
Which one is symmetric? Does it have vertical symmetry or horizontal symmetry?	Figure C. It has vertical symmetry.
Can a shape have two lines of symmetry? Give an example.	Yes. A square, rectangle, circle…
Is the letter A symmetric? What other letters have symmetry?	A is symmetric. B, C, D E, H, I, M, O T U V W X Y

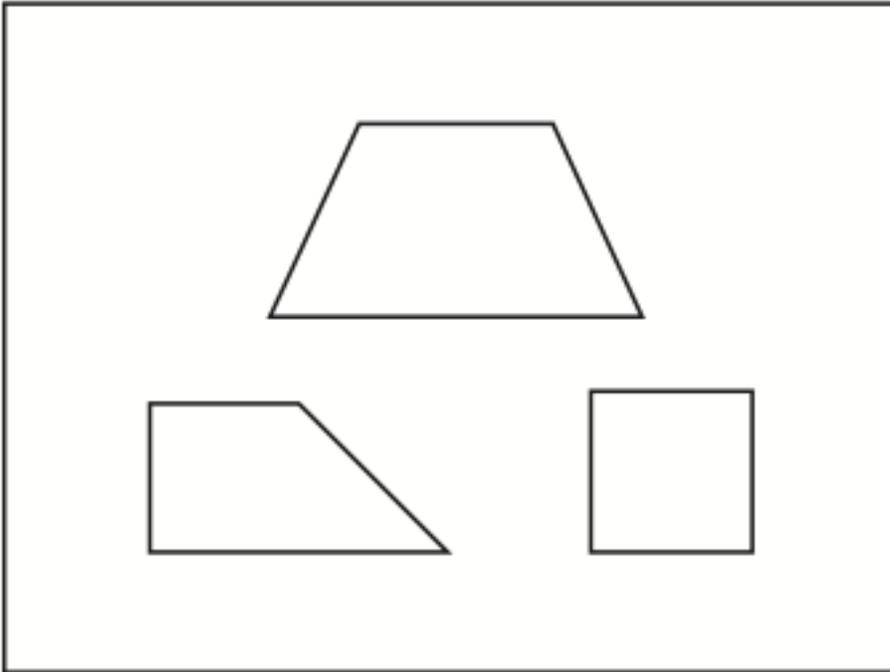Some angles are marked on the bicycle frame shown below.

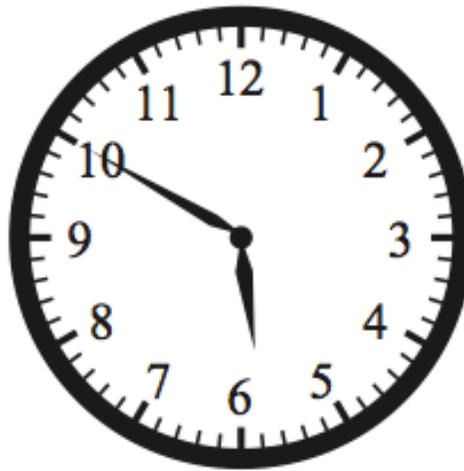| Questions	Answers
What is shown in this picture?	Angles on a bicycle frame.
Which angle is obtuse? How do you know?	Angle A. Its wider than 90°.
Which angles are acute?	Angles D, C, B
How many triangles can you see?	2 triangles
Which angles appears to be the narrowest?	Angle C
Which two angles seem to be congruent?	Angle B and Angle D Also the other angles in B's triangle (not labeled) all seem to be the same.

Anna's Shapes

Questions	Answers
How many sides do these shapes have?	4 sides
What is the name of 4 sided shapes?	Quadrilateral
How many corners are shown in all?	4 + 4 + 4 = 12 corners
Which shape has sides that are all the same length?	The square
Which shape has exactly two sides the same length?	The one on top. It's called a trapezoid because it has exactly 2 parallel sides.
Anna drew two new shapes. One had one less side than these shapes. The other had one more side. What shapes did she draw?	She drew a triangle (3 sides) and a pentagon (5 sides)

The clock below shows the time that Mr. Stone put a cake in the oven.

Questions	Answers
What is this problem about?	The time Mr. Stone put a cake in the oven.
Where is the hour hand (the short hand)?	It's just about on 6.
Where is the minute (long) hand?	It's on the 10.
Look at the hour hand. Is it a little before 6:00 or a little after 6:00?	A little before 6:00.
What time is it?	Ten minutes until six or 5:50
In ten minutes what time will it be?	6:00
If the cake cooks for 1 hour 30 minutes, what time will it be done?	5:50 + 1 hr = 6:50 6:50 + 10 min + 10 min + 10 min 7:20 is when cake is ready

Karin's and Howard's gardens are shaped like rectangles. A model of each garden is shown below.

Karin's Garden

Howard's Garden

| Key |
|---|
| ☐ stands for 1 square foot |
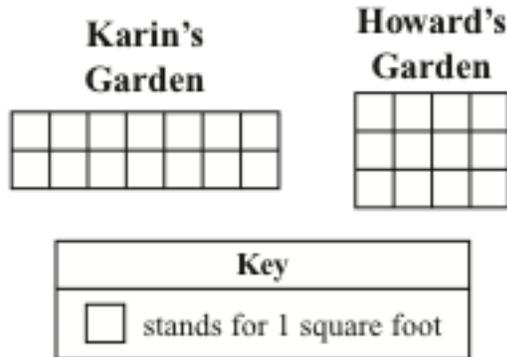
Questions	Answers
Who and what is this about?	Karin and Howard's garden
What will likely be asked?	Who has a larger garden? What is the area of the garden?
How can you find the area of Howard's garden without counting?	3 x 4 = 12
What multiplication problem is suggested by Karin's area?	2 x 7 = 14
Howard's Garden has an area of 12 squares. Can you think of another rectangle that has an area of 12?	12 x 1 6 x 2
How would you find the perimeter of Karin's Garden?	Add up the length of her sides 7 + 2 + 7 + 2 = 18

18 The clocks below show Alex's bedtime and his older sister Patty's bedtime.
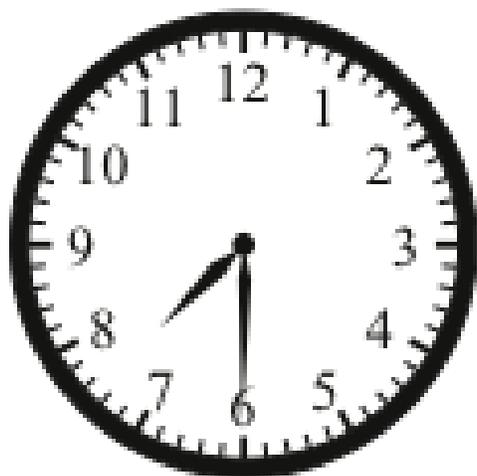
Alex's Bedtime
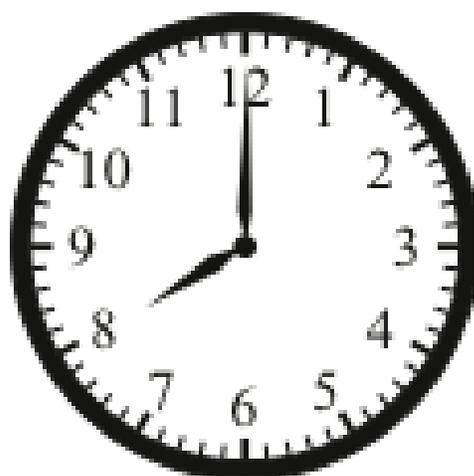
Patty's Bedtime

Questions	Answers
Who and what is this about	Alex and Patty's bedtime
What will likely be asked?	Who has a later bedtime? How much later?
If Patty's bedtime is made 1 hour later, what time will it be?	9:00
If Alex's bedtime was 7:45, how much later is that than 7:30?	15 minutes
If Alex and Patty wanted to have the same bedtime but each would have to meet in the middle, what time would that be?	7:45 is right in the middle between 7:30 and 8:00

What is the perimeter, in centimeters, of the rectangle shown below?

1 centimeter

1 centimeter
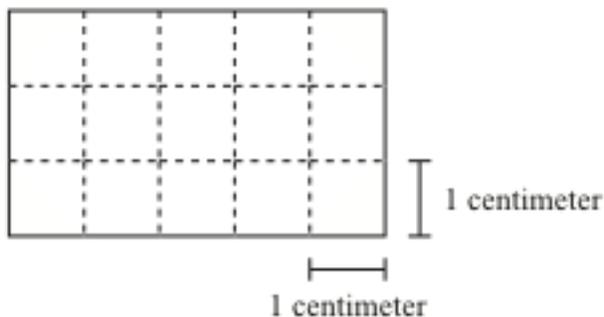
Questions	Answers
How do you find the perimeter?	Add the distance around the shape
What is the perimeter?	5 +3 + 5 + 3 = 16 cm
What is the area?	5 x 3 = 15 square centimeters
Is this shape symmetric? Why?	Yes. Both horizontal and vertical It can be folded perfectly in half and match on both sides.
What kind of shape is this?	Rectangle (parallelogram)
Is this a quadrilateral? Why?	Yes, it has 4 sides
How many corners?	4
What kind of angles?	Right angles
What would it look like if it had length, width and height?	A box or prism
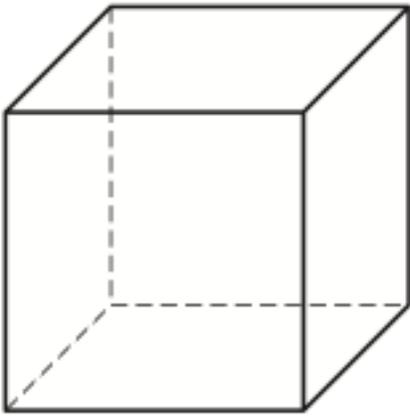
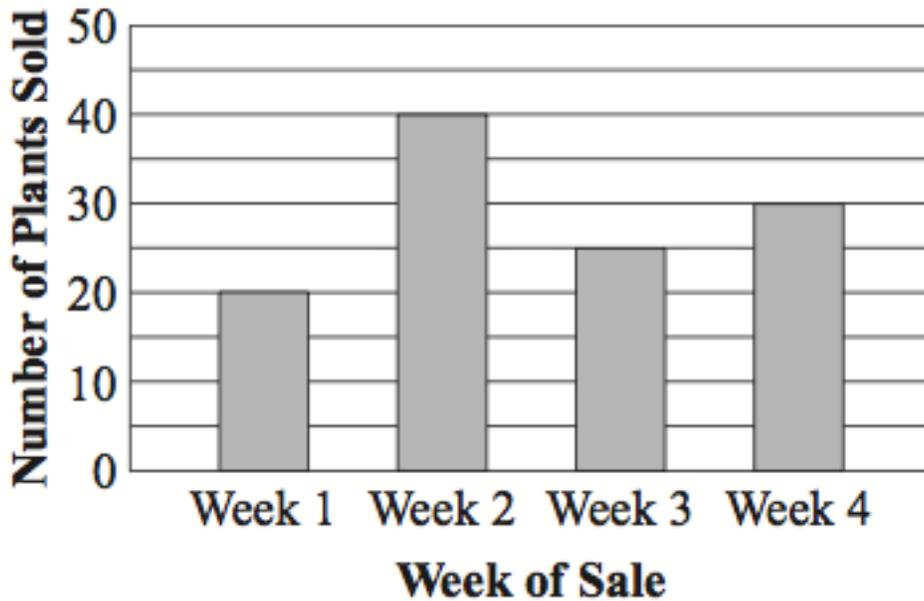| Questions	Answers
What is the name of this shape?	A cube.
Where do you see it in real life?	A box, an ice cube, dice…
How many faces?	6 faces
How many edges?	12 edges
How many corners?	8 corners
What is a mistake students make when counting corners, edges or faces?	They forget the ones in the back, they forget the top an bottom
What would be a good counting strategy?	Number as you count Look for patterns (4 corners on bottom, 4 on top…)

10 The picture below shows the shaded figure that Diego drew on a piece of grid paper.
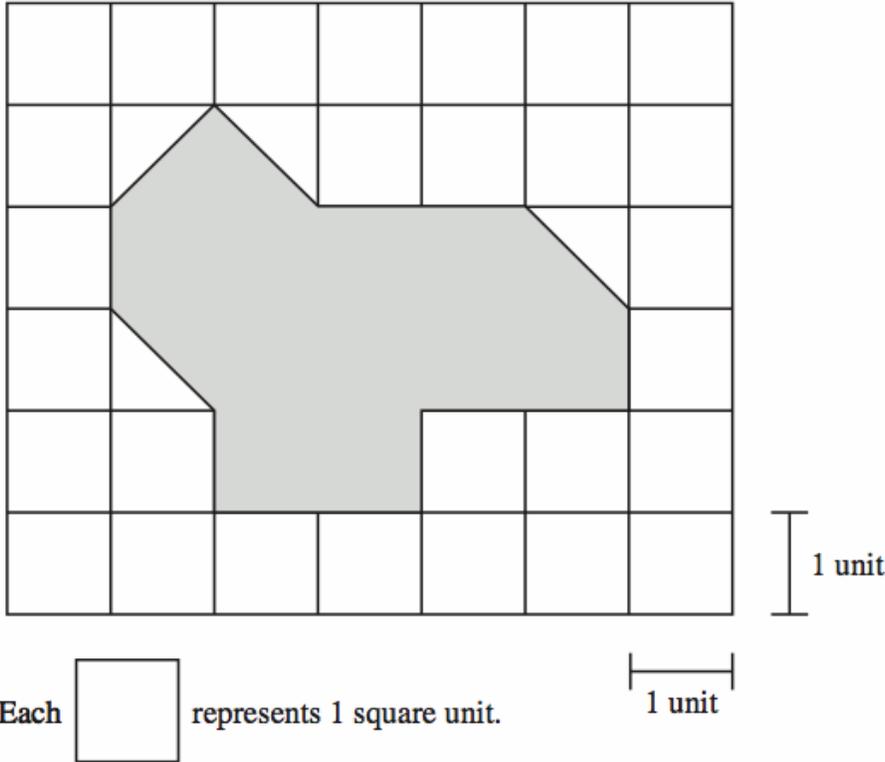
Perimeter is the distance around a shape.

1 unit

1 unit

Each ☐ represents 1 square unit.

Who and what is this problem about?	Diego and his drawing on grid paper.
What does the box represent?	1 square unit
What does perimeter mean?	The distance around a shape
What does area mean?	The squares inside a shape
How would you find the area of this shape?	Draw lines on the shape, then count the squares. Put the halves together to make wholes.
This shape has an area of 12 square units. Can you think of a rectangle with this same area? What are the dimensions (length and width?)	Yes, a 3 by 4 rectangle 2 by 6 rectangle 1 by 12 rectangle

Plants Sold at Franklin School

Questions	Answers
1. What kind of graph is this and what does it show?	It's a bar graph and it shows the number of plants sold each week at the Franklin School.
2. How many more plants were sold Week 3 than Week 1?	Week 3 = 25 Week 1 =20 To find difference 25 -20 5 plants
3. How would you find the total plants sold?	Add all the bars together. 20 +40 +25 + 30 = 115 plants
4. The number of plants sold in Week 5 was five less than the sum of Week 1 and Week 2. How many plants were sold week 5? How would you do it?	Week 5 = (week 1 + week 2) – 5 Week 5 = (20 + 40) – 5 Week 5 = 60 – 5 Week 5 = sold 55 plants

The pictograph below shows the numbers of cars that passed Center School at different times one morning.

Cars Passing Center School

Time	Number of Cars
From 9:00 to 10:00	🚌🚌🚌🚌🚌🚌🚌🚌🚌🚌
From 10:00 to 11:00	🚌🚌🚌🚌🚌🚌🚌🚌
From 11:00 to 12:00	🚌🚌🚌🚌🚌🚌

Key
🚌 stands for 5 cars

Questions	Answers
1. What kind of graph is this?	It's called a pictograph.
2. What does it show?	The number of cars that passed Center School
2. What does the key show and why is it important?	The key shows what each car in the picture stands for. It's important so you can count the cars!
3. How would you find the difference between the lowest and highest?	Use the key to count by 5's. Count the highest Count the lowest Subtract
4. How would you find the total?	Count all the cars by 5's or count all the cars and multiply by 5.

25 The number of students at Park Hill School who were absent each day last week is shown in the tally chart below.

Students Absent at Park Hill School

Day	Number of Students
Monday	卌 卌 ||
Tuesday	卌
Wednesday	卌 ||
Thursday	卌 |||
Friday	卌 卌 卌

Questions	Answers
What is these marks called?	Tally marks.
What is this table show?	How many students absent at Park Hill School.
How are tally marks helpful? How can you count them quickly?	They show groups of 5. You count by 5's and add the rest. It's an easy way to record things.
How many students were absent Friday?	5 + 5 + 5 = 15 students absent
How many more absent Friday than Thursday?	Friday = 15 Thursday = 8 15 - 8 = 7 7 Students
How many absent in all?	8 groups of 5 = 40 7 single tallies 40 + 7 = 47 students in all

The line plot below shows the numbers of books some students read over the summer.

**Number of Books
Read over the Summer**
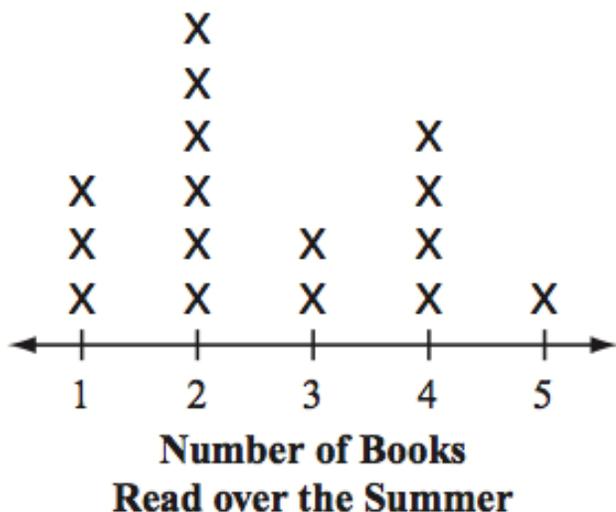
Questions	Answers
What is this graph called? What is it showing?	A line plot The number of books students read over the summer.
What does each x stand for?	Each x stands for a student and how many books he/she read.
How many students read 3 books?	2 students read 3 books.
How many students read fewer than 3?	6 + 3 = 9 students read fewer than 3.
Shelly said only one person read more than her. How many books did Shelly read?	Shelly read 4 books. There is only 1 person who read 5.
How do you find the total books read?	Add all the x's. 3 + 6 + 2 + 4 +1= 16 students
What fraction read 1 book?	1/16
What is the mode of this data?	Mode is most frequent. The mode is 2 books.
What is the median? How do you find the median?	The middle number. Count over from each end.
What is the range of the data?	Range = maximum − minimum Range = 5 − 1 Range = 4 books

Anna's Shapes
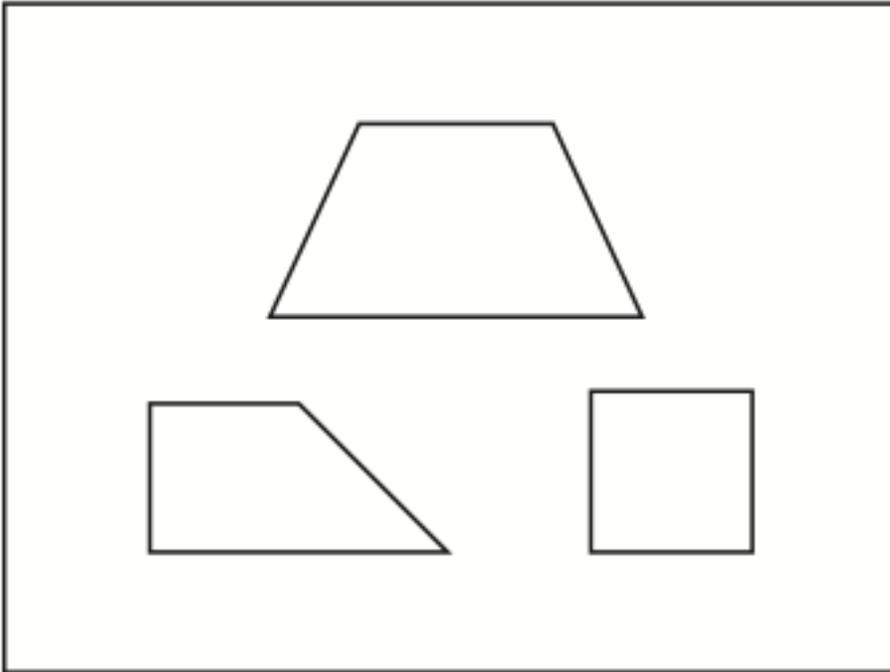
Questions	Answers

18 The clocks below show Alex's bedtime and his older sister Patty's bedtime.

Alex's Bedtime

Patty's Bedtime

Questions	Answers