Math Kangaroo Class Level 3-4

Lesson 2:

Drawing a Picture or Diagram

Warm Up

Instruction

Drawing a Picture or Diagram

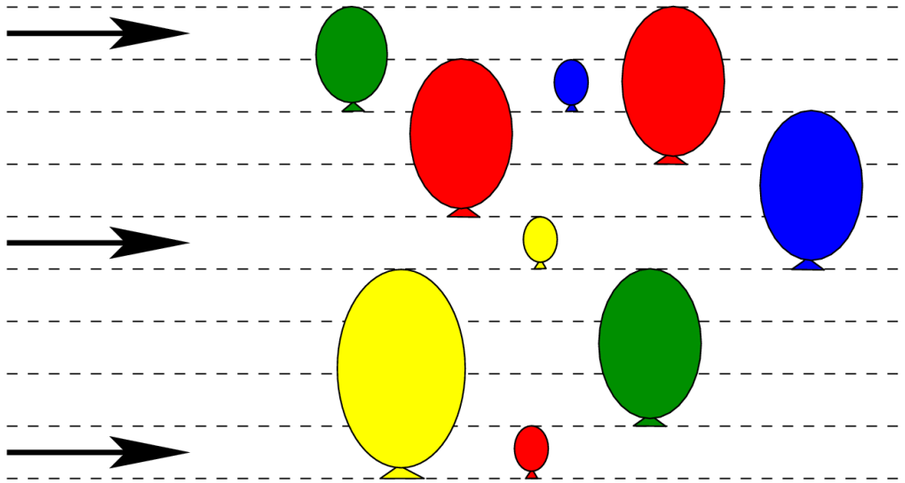
Exit Ticket

Bonus Slides

Warm up

MK 2018 # 2

The picture shows 3 arrows that are flying and 9 balloons that can't move. When an arrow hits a balloon, the balloon pops, and the arrow keeps flying in the same direction. How many balloons will be hit by the flying arrows?



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Roadmap: toolkit of problem-solving strategies

1. Drawing a picture or diagram
2. Making an organized list
3. Making a table
4. Finding a pattern and solving a simpler related problem
5. Guessing and checking
6. Experimenting and acting out
7. Working backwards
8. Logical Reasoning

Lesson 2: Drawing a Picture or Diagram

1. If a problem is not illustrated, sometimes it is helpful to draw your own picture or diagram. A visual representation of the situation may reveal conditions that may not be obvious when you just read the problem.

2. Pictures and diagrams are also useful for keeping track of the various stages of a multi-step problem and often reveal a useful strategy.

3. Use simple symbols to represent objects. Draw to scale according to the description.

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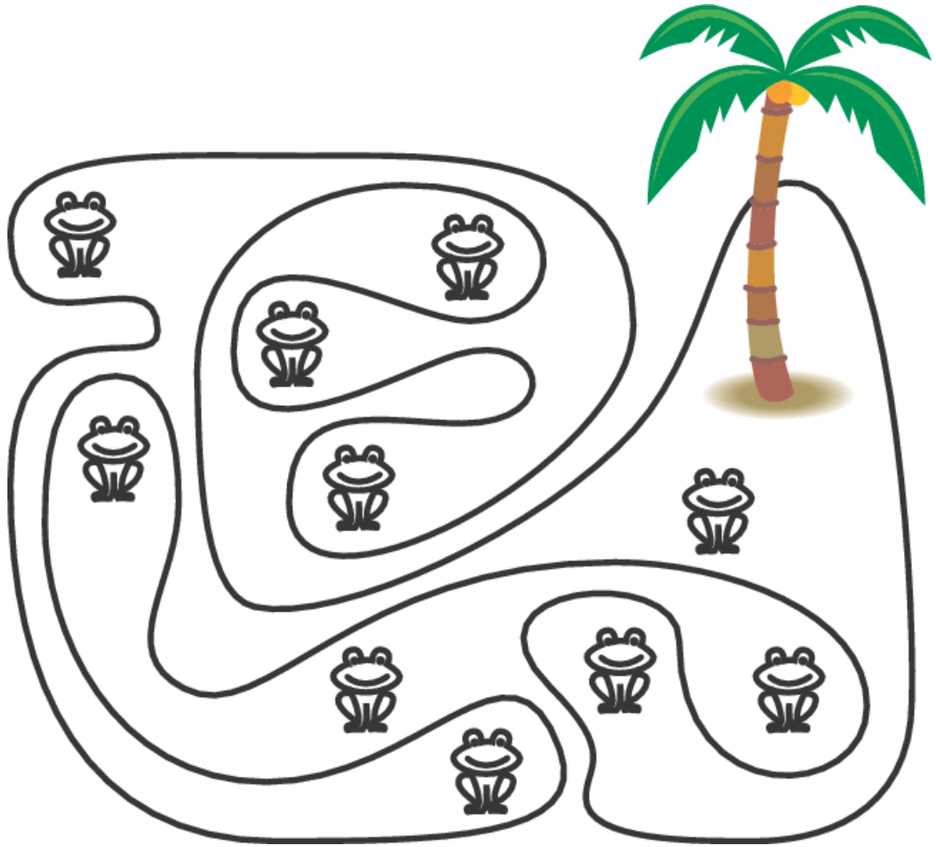
MK 2015 # 7

1. In the picture, we see an island with a highly indented coastline and several frogs. How many of these frogs are sitting on the island?



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MK 2021 # 7

2. Denise fired a silver rocket and a gold rocket at the same time. The rockets exploded into 20 stars in total. The gold rocket exploded into 6 more stars than the silver one. How many stars did the gold rocket explode into?

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MK 2005 # 9

3. What is the smallest number of children in a family where each child has at least one brother and at least one sister?

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MK 2009 #13

4. One side of a rectangle is 8 cm long, while the other is half as long. A square has the same perimeter as the rectangle. What is the length of the side of the square?

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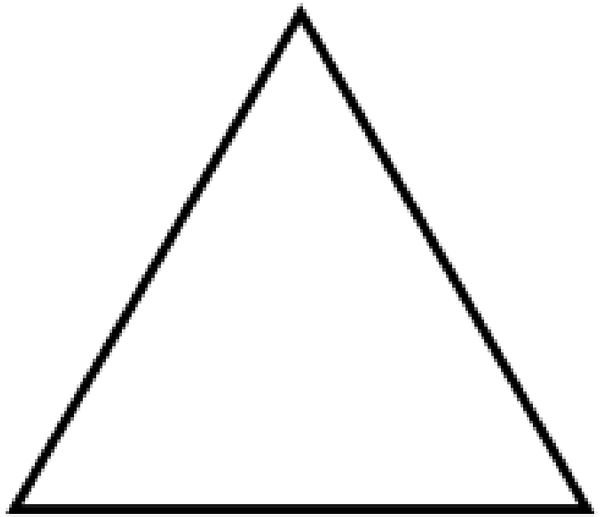
MK 2018 # 15

5. There are 8 flowers on a rose bush. Some butterflies and some dragonflies are sitting on the flowers. There is no more than one insect on each flower. More than half of the flowers have an insect on them. The number of butterflies on the flowers is twice the number of dragonflies on the flowers. How many butterflies are sitting on the flowers?

MK 2013 # 17

6. Joining the midpoints of the sides of the triangle in the drawing, we obtain a smaller triangle. We repeat this one more time with the smaller triangle. How many triangles of the same size as the smallest resulting triangle fit in the original drawing?



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MK 2015 # 19

7. We can fill a certain barrel with water if we use water from 6 small pitchers, 3 medium pitchers, and one large pitcher, or from 2 small pitchers, 1 medium pitcher, and 3 large pitchers. If we use only large pitchers of water, how many of them do we need to fill the barrel?

Exit Ticket

Students to share (in chat or speak up):

1. In which of the problems that we tackled today did you find the drawing strategy to be most helpful?
2. When will you use the drawing strategy? (When a problem is very wordy, involves a geometric situation, or involves many parts that it is helpful to use a diagram as a guideline to work out the details, etc.)
3. What could be the challenges and how can we overcome them?

Students to share the written drafts of their own problems and give and receive feedback.

Optional Homework: Math Kangaroo exam 2014.

Bonus Question

MK 2012 # 23

A rectangular paper sheet measures 192 × 84 mm. You cut the sheet along just one straight line to get two parts, one of which is a square. Then you do the same with the non-square part of the sheet, and so on. What is the length of the side of the smallest square you can get in this way?

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