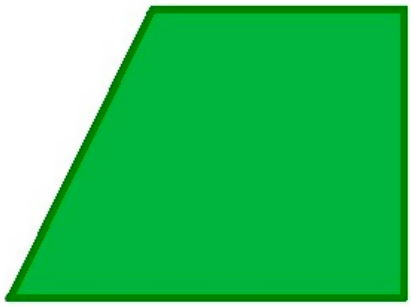
Grades 3-4

1. Alex wrote ten different digits on one red card and nine blue cards, only one digit per card.
The sum of all the digits on the blue cards is 37.
What digit is written on the red card?

2. Two pens cost $1 more than three pencils.
Two pencils cost 50¢ more than three erasers.
Eight pens cost how many more cents than eighteen erasers?
Assume that all pens cost the same, all pencils cost the same, and all erasers cost the same.

3. Imagine that one side of the green shape shown in the diagram is also one side of a red triangular shape located outside the green shape.
How many of the following five statements about the resulting red-and-green shape are true?



- It could be a triangle.
- It cannot be a quadrilateral.
- It could be a pentagon.
- It cannot be a hexagon.
- It could be an octagon.

(Note: a quadrilateral is a shape with four sides; an octagon is a shape with eight sides.)

4. Find the sum of all the digits of the result of the multiplication:

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$$

5. There are 100 puppies at a “Learn with Your Pet” event. Some are pure white, some are pure black, and the rest are *tri*-colored with one white, one black, and two brown paws each. The puppies have 221 white and 34 brown paws altogether.
How many black puppies are at the event?

6. Dina took a rectangular piece of paper with side lengths 10 and 20, and divided it into four non-overlapping rectangular shapes. One of the rectangles has side lengths 5 and 6, and another has side lengths 10 and 15.
Compute the sum of the perimeters of the two other rectangles if they do not share a side.
(The perimeter of a rectangle is the sum of the lengths of all of its sides.)

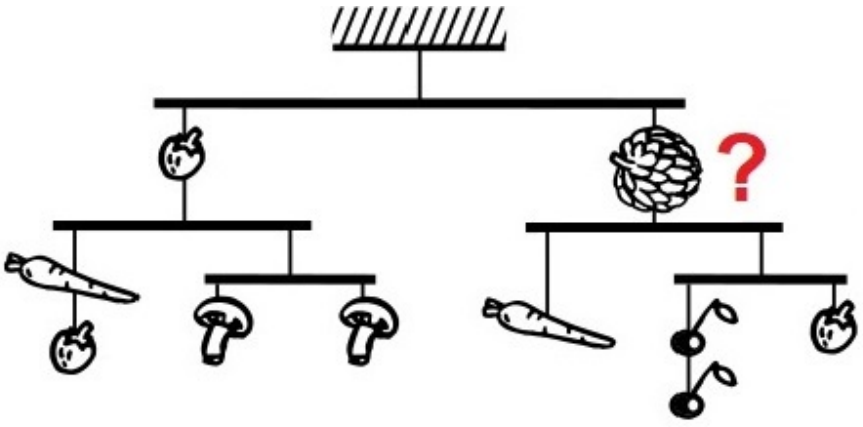
7. The sum of the three-digit numbers *MAS* and *MRS* is equal to the three-digit number *RSM*.
Find the number *RSM* if all its digits are even.
Different letters represent different digits, and the same letters represent the same digits.

$$\begin{array}{r} MAS \\ +\ MRS \\ \hline RSM \end{array}$$

8. Nick has \$5, \$10, \$20, and \$100 bills that total 17 bills. He exchanges all his \$5 bills for \$1 bills, then all his \$10 bills for \$5 bills, then all his \$20 bills for \$10 bills, and finally all his \$100 bills for \$50 bills. At the end, Nick has a total of 52 bills.
How many \$5 bills did Nick have originally?
Assume that each exchange preserves the total dollar amount of Nick's money.

9. Lucie and Suzie buy greeting cards. Lucie buys 10 more cards than half the girls' total.
How many more cards should Suzie buy so that she is the one that has 10 more cards than half the girls' total?
Assume that Lucie does not make any purchases after her initial purchase.

10. The hanger shown in the diagram is balanced. Both cherries weigh the same, both mushrooms weigh the same, both carrots weigh the same, and all three strawberries weigh the same.
How many grams does the exotic fruit weigh if the total weight of all ten items is 84 grams?
Assume that all parts of the hanger itself (horizontal bars and vertical strings) weigh nothing.



11. Each of six jars contains the same number of candies. Alice moves half of the candies from the first jar to the second jar. Then Boris moves half of the candies from the second jar to the third jar. Then Clara moves half of the candies from the third jar to the fourth jar. Then Dara moves half of the candies from the fourth jar to the fifth jar. Finally, Ed moves half of the candies from the fifth jar to the sixth jar. At the end, 30 candies are in the fourth jar, and 31 candies are in the fifth jar.
How many candies are now in the sixth jar?

12. The diagram shows three famous RSM cafes, ***R***, ***S***, and ***M***. It takes one step to move from one of these cafes directly to another.

How many different ways are there to start at ***R*** and end at ***M*** in exactly five steps?

One possible way is

$$R - M - R - S - R - M.$$