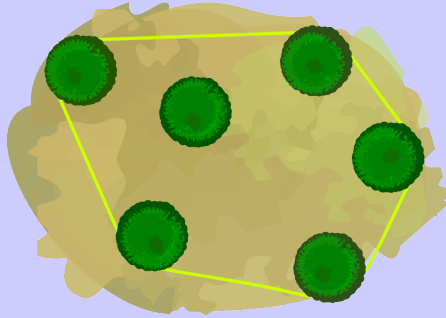*2018
Beaver
Computing
Challenge
(Grade 5 & 6)*

Questions

Part A

Roped Trees

Joni Beaver uses rope to mark groups of trees. The rope forms a very tight loop so that each tree either touches the rope or is entirely inside the loop. Below is an example where the rope touches exactly 5 trees when viewed from above.

Question

How many trees will the rope touch if the trees are arranged as follows (when viewed from above)?
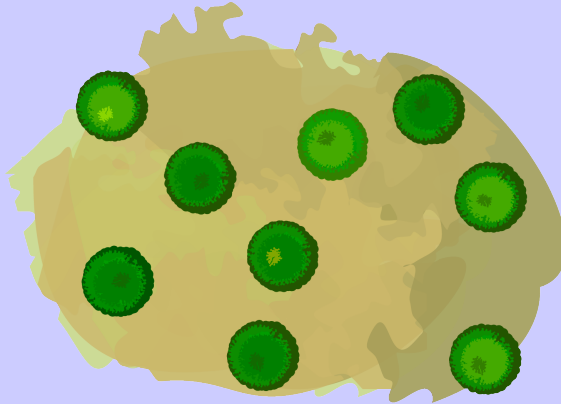
(A) 4

(B) 5

(C) 6

(D) 7

Rotation Game

Story

Beavers play a simple game. The game always begins with this starting position:

From this starting position, rotation instructions are followed. All the rotations are clockwise and one quarter of a complete turn. The possible instructions are:

- 1R – meaning rotate the squares one time,
- 2R – meaning rotate the squares two times,
- 3R – meaning rotate the squares three times.

For example, if the first instruction is 2R, the top-left square will be Yellow as shown below.

Question

From the starting position, what colours will the top-left square be after each of the instructions 1R, 2R, 2R, and 3R are followed in order?
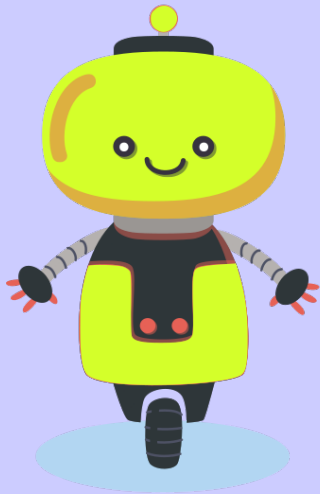
(A) Red Green Blue Green Yellow

(B) Red Blue Green Blue Red

(C) Red Blue Yellow Red Green
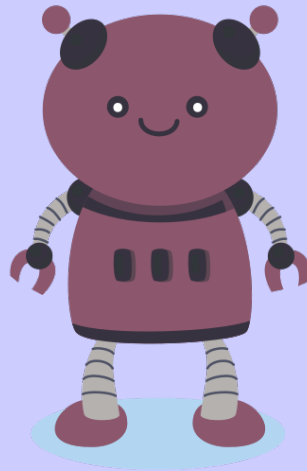
(D) Red Red Yellow Red Blue

Robots

Story

Consider these five statements describing the three robots below:

1. Bob and Moe are smiling.

2. Bob, Moe, and Lea each have two legs.

3. Moe has a round head and exactly one leg.

4. All three robots have five fingers.

5. Lea or Bob have their hands raised.

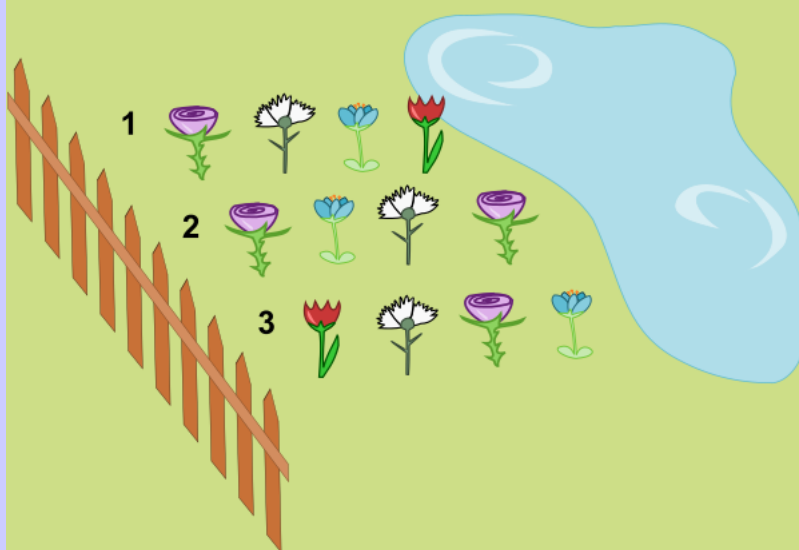LEA   MOE   BOB

Question

Which of these five statements are true?

(A) 2 and 3

(B) 1 and 3

(C) 1 and 5

(D) None

Flowerbed

Story

Flora asked for three rows of flowers to be planted. These rows can be seen below:

However, Flora had asked that the white flower be closer to the fence than the blue flower in each row.

Question

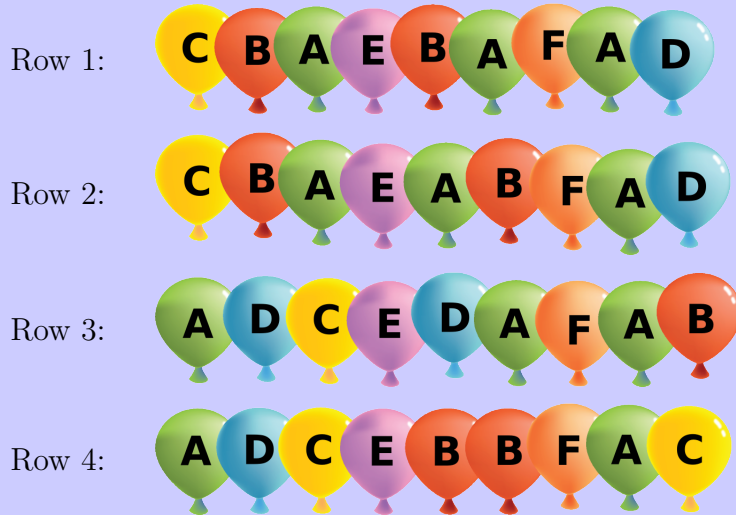Which rows were planted according to what Flora asked for?

(A) Only Row 1

(B) Rows 1 and 2

(C) Rows 1 and 3

(D) All three rows

Part B

Balloons

Story

Mark goes to a birthday party. A room at the party is decorated with balloons in rows:

Row 1: C B A E B A F A D

Row 2: C B A E A B F A D

Row 3: A D C E D A F A B

Row 4: A D C E B B F A C

Mark can't see colours clearly. For him, yellow (C) looks the same as green (A), and blue (D) looks the same as red (B).

Question

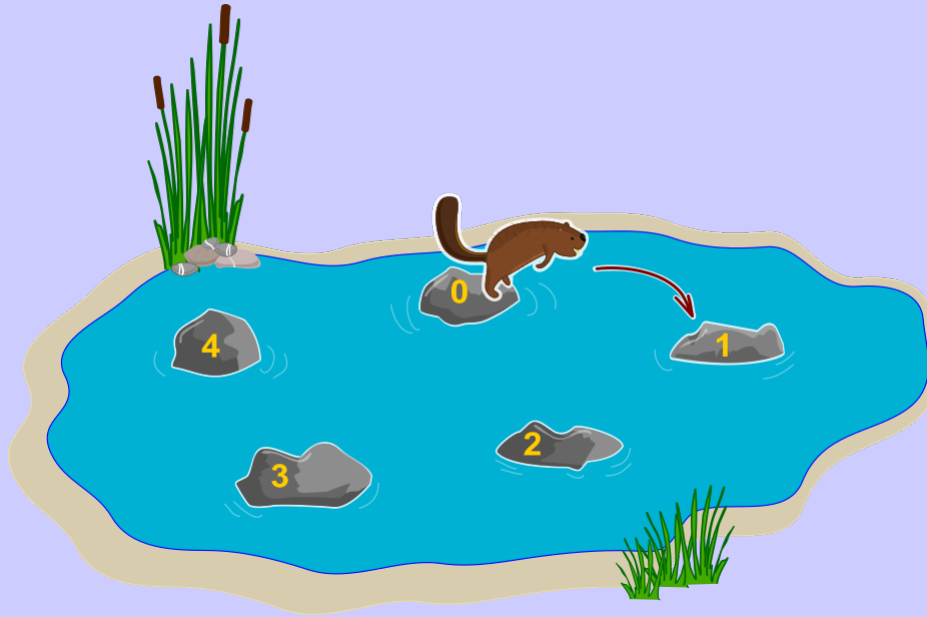Which two rows of balloons look the same to Mark?

(A) Row 1 and Row 4

(B) Row 2 and Row 4

(C) Row 1 and Row 2

(D) Row 1 and Row 3

Beaver Jump Challenge

Story

Beavers take part in an annual challenge. Starting from rock number 0, they jump clockwise from rock to rock. For example, if a beaver jumps 8 times, it ends up on rock number 3:

$$0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 0 \rightarrow 1 \rightarrow 2 \rightarrow 3$$

Question

One of the beavers showed off and jumped an astonishing 129 times. On which rock did it end up?

(A) 4

(B) 3

(C) 2

(D) 1

Lemonade Party

Story

James made 37 litres of lemonade at home and now he wants to bring it to a celebration at school. He has several empty bottles of various sizes but he wants to use the smallest number of them to bottle exactly 37 litres of lemonade.

He has one bottle of each of the following sizes:

- 1 litre
- 2 litre
- 4 litre
- 8 litre
- 16 litre
- 32 litre

Question

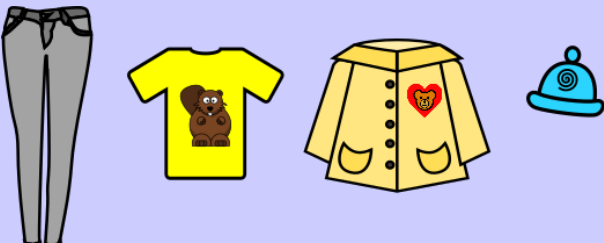What is the least number of bottles James needs to use?
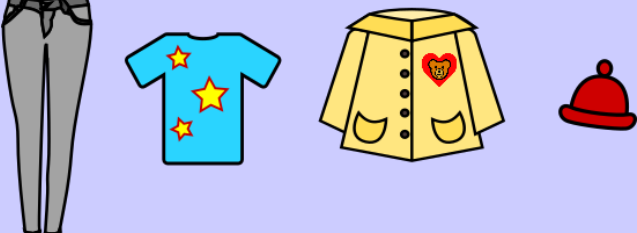
(A) 1

(B) 2

(C) 3

(D) 4

What to Wear?

Every morning Maja decides what to wear for the day. She uses the following rules:

1. If she wears pants, then she wears a T-shirt that is blank or has stars.

2. If she wears a skirt, then she wears a T-shirt with a beaver logo.

3. If she wears a T-shirt that is blank or has stars, then she wears a jacket with a heart.

4. If she wears a jacket with a heart, then she wears a cap with a drawing.

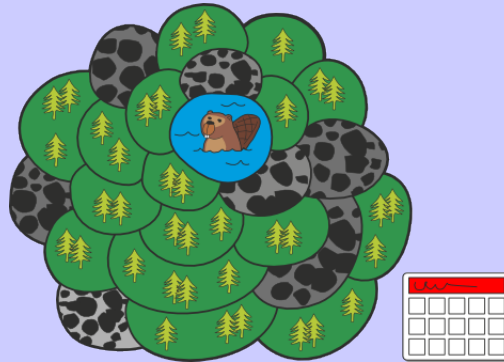## Question

Which of the following combinations can Maja wear?

(A)

(B)

(C)

(D)

11

Part C

Beaver Lake

Beavers live in a valley surrounded by mountains. In the valley, there is a lake. The lake is surrounded by fields with either trees or stones.

Every day, beavers flood all those fields with trees that are next to the lake or flooded fields. Fields with stones are not flooded.

For example, after one day, three fields will be flooded, as shown above.

Question

After how many days in total will all the fields with trees be flooded?

(A) 4 days

(B) 5 days

(C) 6 days

(D) 7 days

Ring Toss

Story

Sarah tries to throw five rings around a peg as part of a game. The following chart shows how points are earned each time a ring lands around the peg. Rings that do not land around the peg do not earn points.

Toss	Points
First Toss	5
Second Toss	4
Third Toss	3
Fourth Toss	2
Fifth Toss	1

The following picture illustrates the order in which Sarah threw her five rings. It also shows which ones landed around the peg and which ones did not land around the peg.
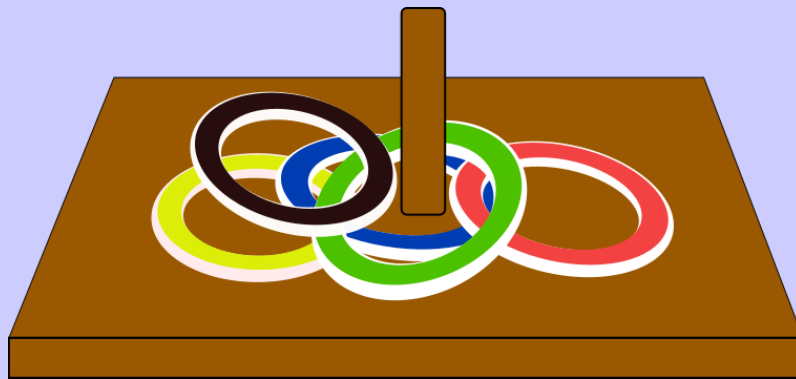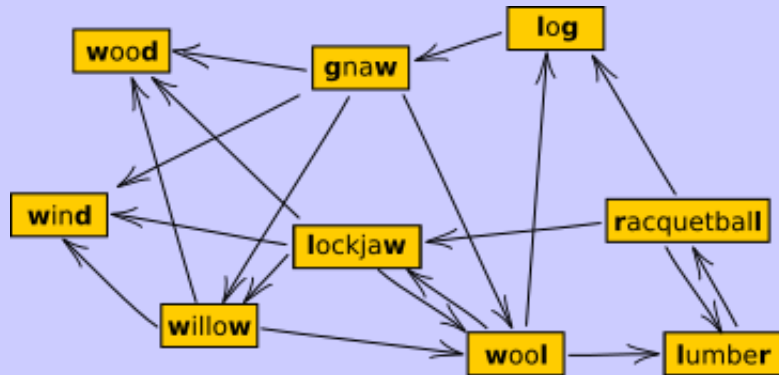

Question

How many points did Sarah earn?

(A) 15

(B) 9

(C) 6

(D) 3

Longest Word Chain

Story

Beavers play a word chain game. One beaver starts by saying a word. The other beaver must say a different word which begins with the last letter of the previous word. Then the first beaver says another word (which was not said yet) using this same rule, and so on. If a beaver is unable to say a new word, that beaver loses the game. These beavers do not know many words. In fact, they can draw their entire vocabulary like this:

Notice that an arrow out of a word points at the next possible word(s) that can be said.
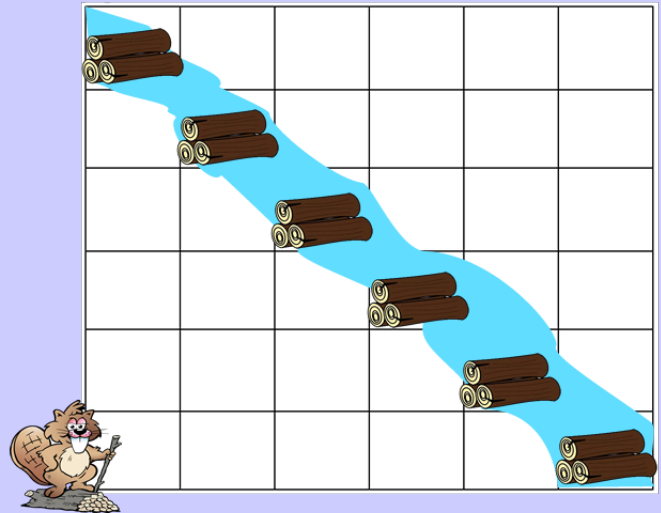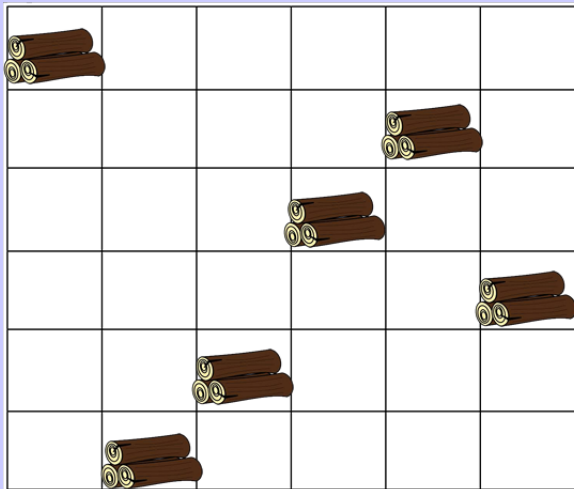
Question

What is the largest possible number of words that can be said in one game?

(A) 6

(B) 7

(C) 8

(D) 9

Dam Construction

Story

A beaver wants to build a dam to protect her house from a winter flood. She will use the log piles shown in the figure on the left to produce the dam shown in the figure on the right. It takes 1 hour to move a pile of logs one square in a vertical direction on the figure, and 2 hours in a horizontal direction.

Question

What is the minimum number of hours it will take to build the dam?

(A) 16

(B) 11

(C) 14

(D) 12