



UNIVERSITY OF
WATERLOO



The CENTRE for EDUCATION in
MATHEMATICS and COMPUTING



2017
*Beaver
Computing
Challenge
(Grade 5 & 6)*

Questions

Part A

Bird House

Story

A parent takes their child to the store to buy a bird house. The child says “I would like a bird house with two windows and a heart decoration.”



HOUSE 1



HOUSE 2



HOUSE 3



HOUSE 4

Question

Which of the bird houses matches this description?

- (A) House 1
- (B) House 2
- (C) House 3
- (D) House 4

Risk

Story

Darren's computer is connected to the Internet but does not have any antivirus or firewall software. None of the accounts on his computer are protected by a password.



Question

Which computers are at risk because of this?

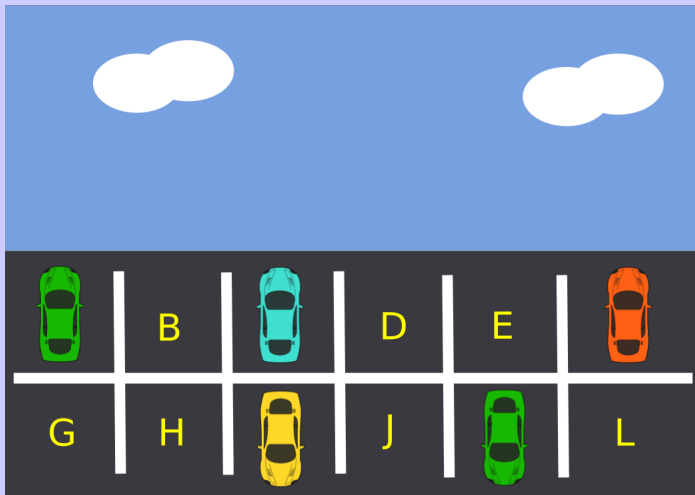
- (A) only Darren's own computer
- (B) only the computers in the same room as Darren's computer
- (C) only the computers in the same country as Darren
- (D) all computers in the world which are connected to the Internet and set up like Darren's

Parking Lot

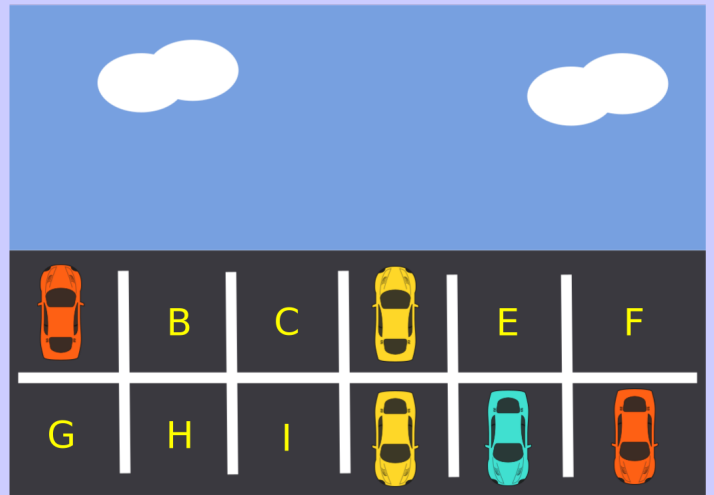
Story

There are 12 spaces for cars in a parking lot. The pictures below show which spaces were used on Monday and which spaces were used on Tuesday.

Parking lot on Monday



Parking lot on Tuesday



Question

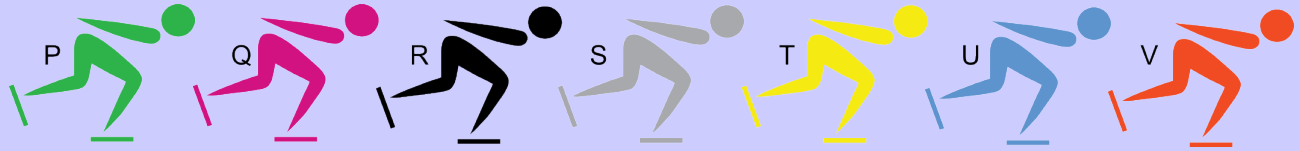
How many parking spaces were empty on both Monday and Tuesday?

- (A) 3
- (B) 4
- (C) 5
- (D) 6

Skaters

Story

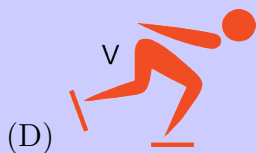
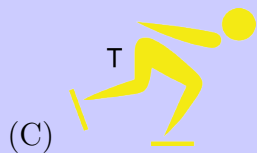
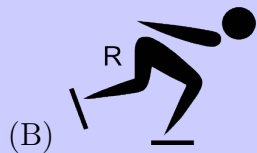
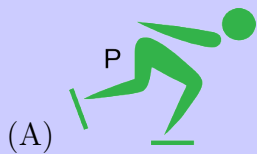
Seven people are skating in a line on a very long, frozen canal. They begin as shown below.



After every minute the person at the front of the line moves to the end of the line. For example, after one minute, U will be in front of the line, since V will move behind P.

Question

Which skater will be at the front of the line after 9 minutes?

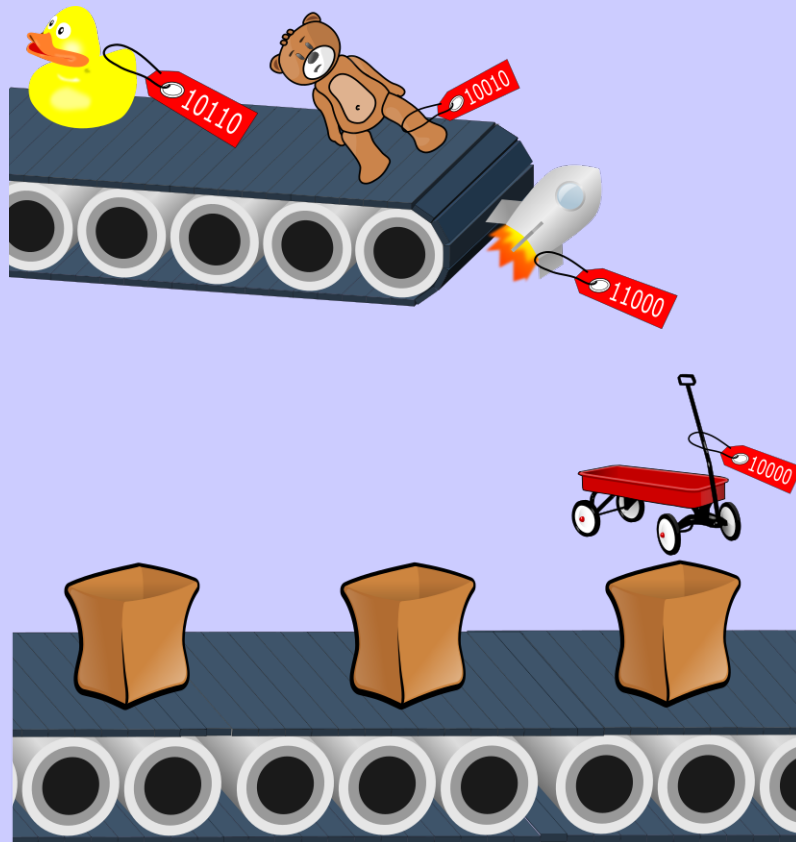


Part B

Toy Factory

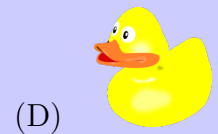
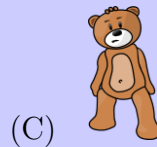
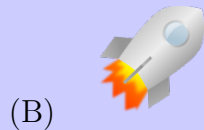
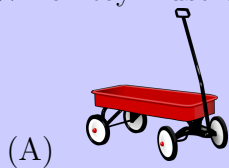
Story

Toys fall from a high conveyor belt into bags on a low conveyor belt. The toys should fall into the bags with their numerical product codes in increasing order. One of the toys is in the wrong place and needs to be removed so that the remaining toys are in the right order.



Question

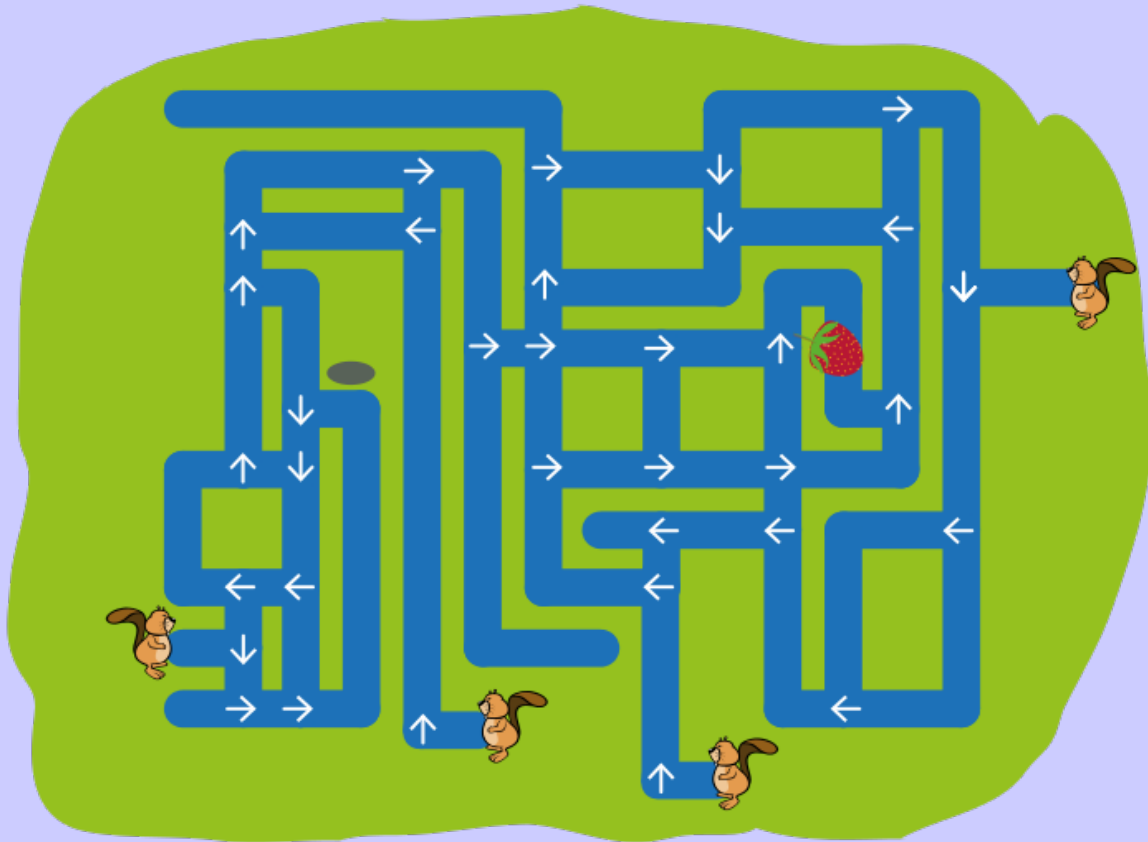
Which toy must be removed?



Strawberry Hunt

Story

Four beavers swim through canals in an attempt to find a strawberry. They start at different places and always move in the direction of the arrows shown below.



Each beaver either finds the strawberry, swims in a loop forever, or reaches and remains at a dead-end.

Question

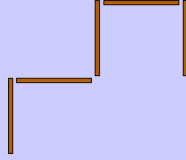
How many beavers find the strawberry?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

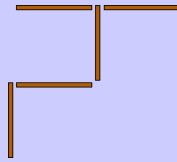
Five Sticks

Story

Nola puts five sticks on the table making this shape:



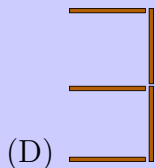
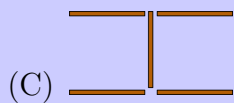
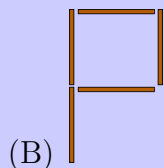
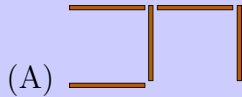
Then Adam moves one stick to a different place making this shape:



Now, Vera wants to move one stick to a different place.

Question

Which shape is Vera **not** able to make?



Toy Storage

Story

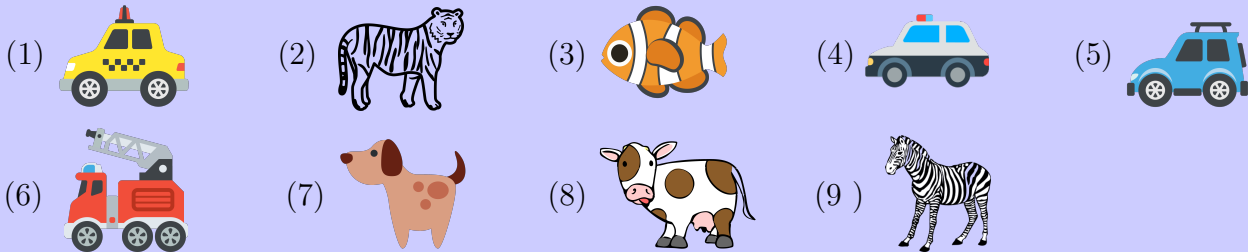
Tom has two types of toys: animal toys and vehicle toys. Tom fills three boxes by putting three toys in each box. As long as there is room, he puts

- vehicles into box A,
- animals with striped bodies into box B, and
- animals with spotted bodies into box C.

However,

- Anytime he tries to put a toy into box A and it is full, he then tries to put the toy into box B.
- Anytime he tries to put a toy into box B and it is full, he then tries to put the toy into box C.
- Anytime he tries to put a toy into box C and it is full, he then tries to put the toy into box A.

Tom puts the following nine toys into boxes in the following order:



Question

Where does Tom put the dog and zebra?

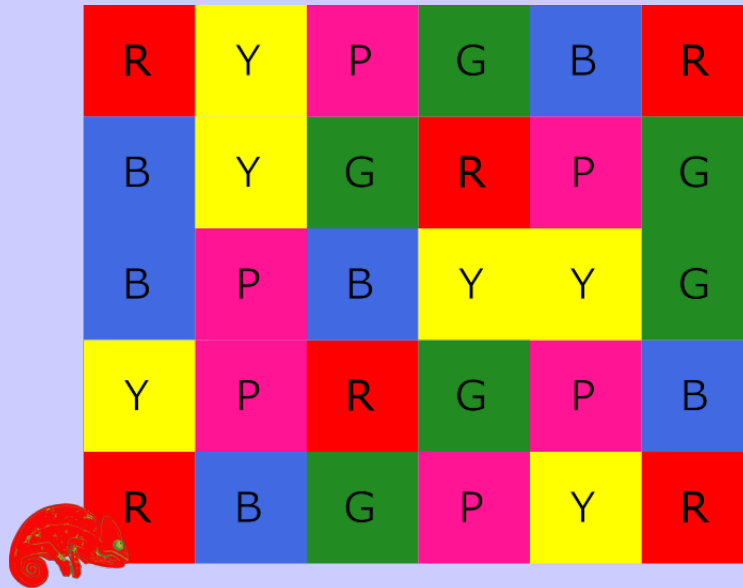
- (A) Tom puts the dog in box C, and the zebra in box B.
- (B) Tom puts both in box A.
- (C) Tom puts both in box B.
- (D) Tom puts both in box C.

Part C

Chameleon

Story

A chameleon travels on the grid below. It moves between adjacent cells either horizontally, vertically or diagonally. In a cell, a chameleon has the same colour as the colour of the cell.



Question

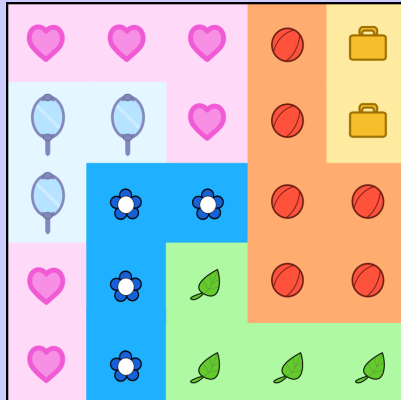
What is the minimum number of different colours that the chameleon has when traveling from the lower left of the grid to the upper right?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Wallpaper

























Story

Robyn covers a wall with six overlapping rectangular sheets of wallpaper as shown. Each sheet of wallpaper is designed using a different image in a repeating pattern.



Question

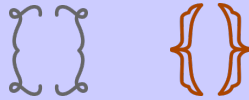
What is the order of the wallpaper pieces from the one placed first to the one placed last?

- (A)      
- (B)      
- (C)      
- (D)      

Bracket Bracelet

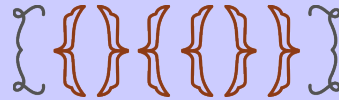
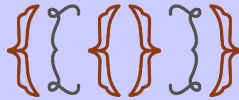
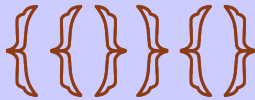
Story

A jewelry shop produces chains used to make bracelets. The chains are built by continually adding matching pairs of bracket-shaped ornaments. There are two types of pairs:



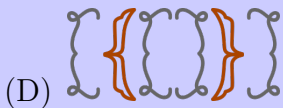
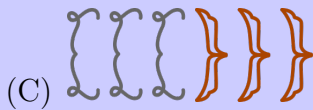
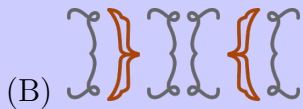
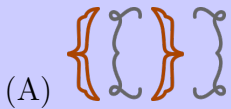
After choosing a starting pair, a second pair is either added to the end of the chain or inserted between the previously added pair. This process can be repeated any number of times.

Examples of three different chains that can be produced are shown below.



Question

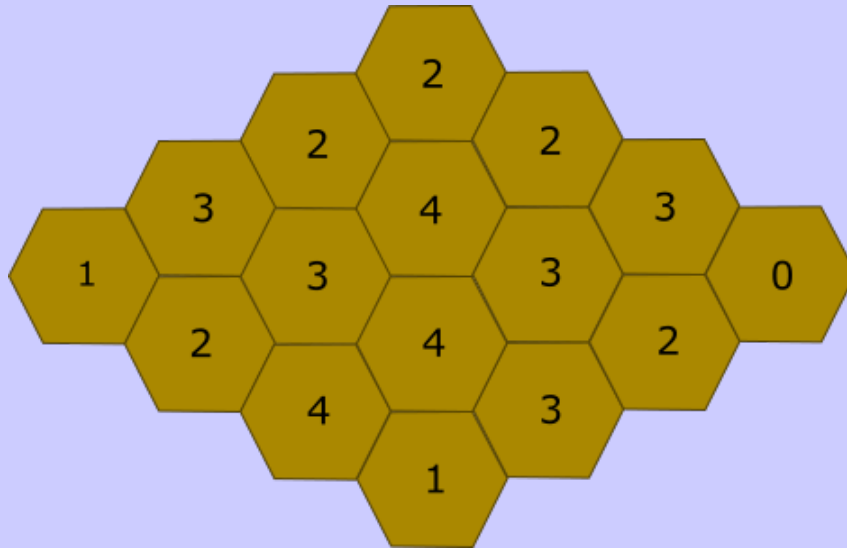
Which of the following chains can also be produced?



Beehive

Story

A bear studies how many hexagons in a honeycomb contain honey. For each hexagon, the bear records how many *other* hexagons touching this hexagon contain honey. So this number could be 0, 1, 2, 3, 4, 5 or 6. The results of the bear's study are below.



Question

How many hexagons contain honey?

- (A) 7
- (B) 8
- (C) 9
- (D) 10