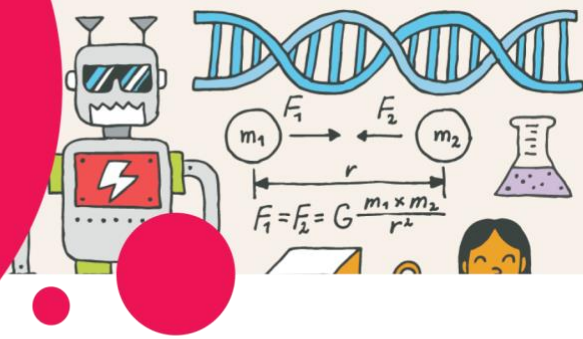


# Stable Structures



## ANSWER KEY

### Bicycle Vortex (p. 3)

#### Exhibit – Into the Great Outdoors – Freedom on Two Wheels

**Find** the bikes in the vortex. Rank these bikes from least stable to most stable. Circle the number that represents the bike's ranking.

	Least Stable ..... Most Stable			
Safety bicycle	1	2	3	4
Ordinary	1	2	3	4
Tricycle	1	2	3	4
Hobby horse	1	2	3	4

**Think:** What makes your top-ranking bike the most stable?

- 4 - The tricycle is most stable thanks to its three wheels.
- 3 - The safety bicycle is also fairly stable compared to the hobby horse and ordinary bicycle, it is a design that we still use today!
- 2 - The hobby horse was hard to steer and push forward sometimes causing crashes!

1 - *The ordinary bicycle is the least stable since the rider is so high off the ground.*

## **Snow Levels (p. 4)**

### **Exhibit – Into the Great Outdoors – Snow fall Column**

**Find** which city gets:

Most snow: *St-John's, Newfoundland averages 322cm per year*

Least snow: *Victoria, British Columbia averages 44cm per year*

**Think:** How could the amount of snow in a region influence how structures in that region are built?

*In regions that have a heavy snowfall, structures must have solid roofs to withstand the weight of snow. Roofs that are sloped allow the snow to slide off.*

## **Mining (p. 5)**

### **Exhibit – From Earth to Us – Prospector Tent**

**Find** the tent. What shape is it?

b) *Dome*

**Think:** This tent was made to meet certain conditions. What are they?

*This tent was made for use in Haiti, where it would face strong winds and rain.*

What do you think makes a tent this shape strong and stable?

*Answers may vary.*

*With fewer flat surfaces, the dome is more wind-resistant. Wind, rain and snow won't build up on its surface.*

## **Skeleton (p. 6)**

### **Exhibit – Medical Sensations – Human Skeleton**

**Find** the human skeleton and look at its head.  
What shape is the skull?

*Oval*

This shape allows the skull to absorb shock, making it strong. Can you think of any other fragile structures that have the same shape?

*Answers may vary. For example: Eggs, watermelon, balloons, grapes, lightbulbs, etc.*

## **‘YOU’ Standing Tall (p. 7)**

### **Exhibit – Hidden Worlds – How Many YOUs?**

How many “YOU”s does it take to reach the height of the CN Tower?

*Answers will vary.  
About 40 to 60*

How many hockey pucks would you need to build a tower as tall as the shortest person in your group?

*Answers will vary.*

Would this tower be a stable structure?

*No*

With nothing but more hockey pucks on hand, how could you make it more stable? Sketch your answer below.

*Answers will vary. For example: Build the structure in a pyramid shape.*

## Strong Roofs (p. 8)

### Look Outside!

Can you see the Ingenium Centre next door? What shape is the roof?

*The roof is flat.*

**Think:** The roof needs support to counter a major force. What is it?

*Gravity*

In Canada, we must account for extra weight accumulating on roofs throughout out the year. Why do you think that is?

*In Canada, winter brings a lot of snow and ice. In construction, this must be taken into account so that roofs are supported and can withstand extra weight.*

What is the most common shape for house roofs? Why?

*Sloped, so that snow, ice and rain fall naturally and do not build up.*

## Living Small (p. 9)

### Exhibit – Technology in Our Lives – Tiny House

Which structure in the Tiny House acts as a bridge?

**Hint!** What connects the top floor to the main floor?

*The stairs.*

**Think:** The Tiny House is incomplete! What would you add to finish it?

*Answers will vary. For example: Doors, a roof, running water, etc.*