

## Dream Jobs: Designing thrilling rides

By Cricket Media, adapted by Newsela staff on 08.19.19

Word Count 725

Level 820L



Image 1. Amusement park-goers enjoying the thrills of a roller coaster. Photo by: Pixabay, Creative Commons

The loops twist you upside down and sideways. The gravity-defying hills swoop up and down. As the car reaches the top of a hill, you look down at the track ahead of you and desperately hope that whoever designed this roller coaster knew what he or she was doing!

Maybe you think designing roller coasters would be one of the coolest jobs in the world. Yet creating a roller coaster isn't simple. It's not only about deciding where loops and twists will be. It takes both design and engineering to make sure a roller coaster is fun and safe.

### What Goes Into Planning A Roller Coaster?

Roller coasters are always designed for a certain amusement park. Designers must find out what the park wants. Will the coaster be made from traditional wood or steel? What types of riders will use the coaster? How many riders must it fit? Will it be a gentle, slow ride? Or one that's fast with tall hills, exciting loops and drops? The coaster can even be a log ride with water instead of tracks.

The designer also looks at the land at the planned site. It might include hills or great views that should be included. Roller coasters take space and might have to be threaded around existing rides

and landscaping at the park.

Next, the designer decides what kind of "feel" he or she wants for the coaster. The designer chooses what material the coaster will be constructed from. Wooden coasters do not usually have loops, and they aren't as fast as steel coasters. However, they have another advantage. They sway when you ride them! Coasters made of steel can have loops as well as higher, steeper hills and deeper drops and rolls.



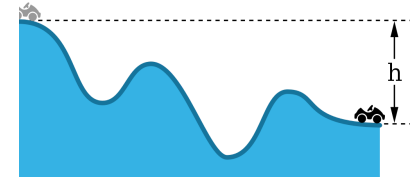
### There's A Science To Those Drops

Once they've determined the material, a designer might start with a steep hill. Then comes the sharp drop. Next, designers might flatten out the hills in the middle. Another possibility is adding a drop with a quick change to a flat section. This is called a "slammer" because it slams the riders back in their seats.

Designers can use computers to figure out the force of the ride and the effect it will have on the passengers. After all, they do not want to design a roller coaster that makes riders black out! Once the designer has created a plan for the new roller coaster, the amusement park must approve it.

### The Ride Is Tested Again And Again

Finally, the coaster is built. Steel coasters are built in parts at a factory and then put together at the park. Wooden coasters are usually built at the park. Builders first put in the supports, and then install the track, walkways and handrails. The chain systems and the device that keeps the cars from rolling backward come next. Meanwhile, the cars have been built at another factory. Their bodies are made from aluminum or molded from fiberglass and have running wheels and guide wheels bolted on.



Once everything is finished, the coaster must be tested for safety. The cars are filled with weighted bags of sand. They weigh about the same as people. The ride is tested many times. Government inspectors must approve the ride. Usually a year from the start of the project, the day comes when roller coaster fans can line up for the first ride!

### Designers Learn On The Job

There are only about 100 companies in the U.S. that design the rides. These companies have many different types of engineers, including electrical, mechanical and drafting engineers. They also have structural designers.

There are no special schools for roller coaster designers. They go to college for an engineering degree. Then they learn on the job. Kent Seko works as a roller coaster designer for Arrow Dynamics. "It's a great business to be in," Seko says. "It really gets in your blood."

# 5th Grade Printables

## Quiz

1 Read the following selection from the section "What Goes Into Planning A Roller Coaster?"

*Wooden coasters do not usually have loops, and they aren't as fast as steel coasters. However, they have another advantage. They sway when you ride them!*

What is the meaning of the word "advantage" in the selection above?

- (A) goal
- (B) benefit
- (C) challenge
- (D) weakness

2 Read the following selection from the section "There's A Science To Those Drops."

*Once they've determined the material, a designer might start with a steep hill. Then comes the sharp drop.*

Which answer uses "sharp" in the SAME way as the sentence above?

- (A) It is important to handle sharp kitchen knives in a safe manner.
- (B) Her teacher was proud of her sharp responses on the weekly test.
- (C) He was caught off guard by the sharp pain he got in his stomach.
- (D) The truck approached a sharp curve ahead in the road.

3 Look at Image 2 and read the selection below.

*Wooden coasters are usually built at the park. Builders first put in the supports, and then install the track, walkways and handrails.*

How does Image 2 support the information in the selection above?

- (A) It shows how builders put wooden coasters together at parks.
- (B) It shows that wooden coasters are not as fast as steel coasters.
- (C) It shows what a finished wooden coaster looks like.
- (D) It shows the steps for designing a wooden coaster.

4 Use the three images and information from the article to select the TRUE statement.

- (A) The drops on a roller coaster ride can become less sharp toward the end of the ride.
- (B) The drops on a roller coaster ride are always the steepest at the end of the ride.
- (C) The tallest and fastest roller coasters are usually made out of wood.
- (D) The roller coasters that are made out of steel are incapable of making loops.

## Answer Key

1 Read the following selection from the section "What Goes Into Planning A Roller Coaster?"

*Wooden coasters do not usually have loops, and they aren't as fast as steel coasters. However, they have another advantage. They sway when you ride them!*

What is the meaning of the word "advantage" in the selection above?

- (A) goal
- (B) benefit**
- (C) challenge
- (D) weakness

2 Read the following selection from the section "There's A Science To Those Drops."

*Once they've determined the material, a designer might start with a steep hill. Then comes the sharp drop.*

Which answer uses "sharp" in the SAME way as the sentence above?

- (A) It is important to handle sharp kitchen knives in a safe manner.
- (B) Her teacher was proud of her sharp responses on the weekly test.
- (C) He was caught off guard by the sharp pain he got in his stomach.
- (D) The truck approached a sharp curve ahead in the road.**

3 Look at Image 2 and read the selection below.

*Wooden coasters are usually built at the park. Builders first put in the supports, and then install the track, walkways and handrails.*

How does Image 2 support the information in the selection above?

- (A) It shows how builders put wooden coasters together at parks.
- (B) It shows that wooden coasters are not as fast as steel coasters.
- (C) It shows what a finished wooden coaster looks like.**
- (D) It shows the steps for designing a wooden coaster.

4 Use the three images and information from the article to select the TRUE statement.

- (A) The drops on a roller coaster ride can become less sharp toward the end of the ride.**
- (B) The drops on a roller coaster ride are always the steepest at the end of the ride.
- (C) The tallest and fastest roller coasters are usually made out of wood.
- (D) The roller coasters that are made out of steel are incapable of making loops.

# Your body's growth is largely determined by your DNA

By Cricket Media, adapted by Newsela staff on 04.05.20

Word Count **657**

Level **810L**



Colored X-ray showing the bone growth of the human hand at the ages of (from right) 1 year, 3 years, 13 years and 20 years. Photo: SPL/Science Source

The tiny egg cell you grew from was smaller than the head of a pin. By the time you are fully grown, your body will be up to 20,000 times larger. That's a lot of growing.

## Ready For Your 2nd Growth Spurt?

In all animals, humans included, growth happens as cells swell, divide and connect. Even after you reach your full height, new cells are always growing to replace old ones. Old cells are lost or recycled by the thousands every day.

Growth happens all over your body. Different body parts grow at different speeds. By the time you're 10 years old, your head is almost grown-up size. The rest of you may take another 10 years to catch up! Inside your body, your heart, lungs and other organs all grow at their own speeds. Your height depends on how your bones grow.

As your spine and the bones in your legs and arms get longer, you get taller. However, their stretching and growing longer is far from steady. It speeds up during two super-speedy growth spurts. The first is when you are a baby. In your first year of life, you grew about 25 centimeters (10 inches)! After that, your growth slowed to about 3 to 8 centimeters (1 to 3 inches) each year. The second growth spurt is when you are a teenager. During puberty, you may shoot up by 10 centimeters (4 inches) a year or more. Most of the time, girls get their growth spurts earlier. Girls are taller than boys for a couple of years at school.

### **Hormone Flows Vary**

At some point, your body has to stop getting bigger. Like other animals, human beings have evolved to be just the right size. We keep growing until we're large enough to survive alone and unprotected. If we're too small, we can't defend ourselves. If we grow too large, it puts dangerous pressure on our bones and the places they connect, called joints. It also puts dangerous stress on our hearts.

Exactly how big you will get is coded into your DNA. Your DNA is like very long instructions for making you. There is a complete copy inside every cell. Cells follow different parts of the DNA instructions based on where the cell is in your body and chemical signals from other cells. DNA tells each cell what kind of cell to become. It tells each cell when to keep dividing.

Chemical messengers called hormones turn on much of your growth. Hormones are made in special glands. They flow through your bloodstream, carrying messages to cells. Your body makes different amounts of hormones at different stages of life. As a baby and during puberty, they flood your blood.

Once you've gone through puberty, you're fully developed. Your body makes fewer hormones, your cells get the message to stop dividing so quickly and you stop getting bigger. You've grown up!

### **You Get Your Parents' Hand-me-downs : Genes**

How tall you grow depends on the sections of DNA, called genes, you get from your mom and dad. Most children end up roughly as tall as their parents, or somewhere in between. Sometimes children grow taller than their parents, if their growth signals tell their bones to keep growing for a longer time. In rare cases, there are errors in the DNA. They can cause the body to make too little or too much growth hormone. Then the body may stop growing too soon, or keep growing for too long.

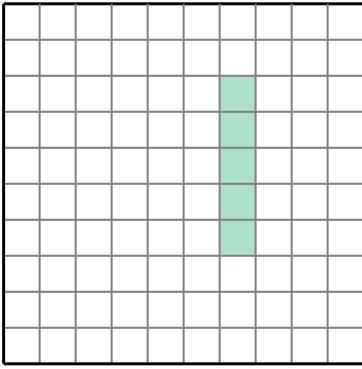
Your cells are working hard to grow to your proper height. To get there, your body also needs the right supplies. These are healthy foods, sleep, exercise and sunshine. Sunshine helps make vitamin D for strong bones. If you want to grow big and strong, don't bother stretching your legs every day, or sleeping upside down like a bat. Just eat right, go out and play and leave the rest to your DNA.

Every school counselor and student assistance counselor is available to support students during this time. Please feel free to reach out to them via email to set up a time to talk. Linn-Mar specific information and resources can be found at <https://tinyurl.com/wecareaboutyou>

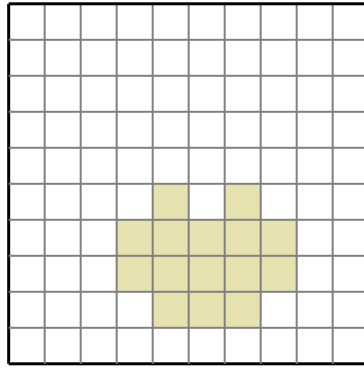


Find the perimeter of each shaded section. Each block is 1 square unit (u).

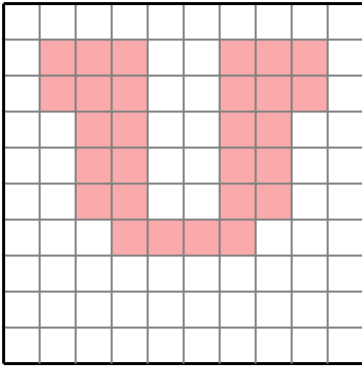
1)



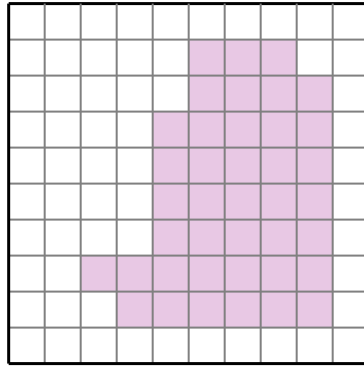
2)



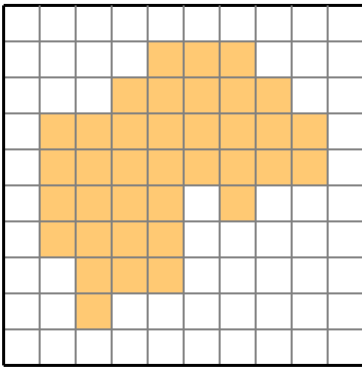
3)



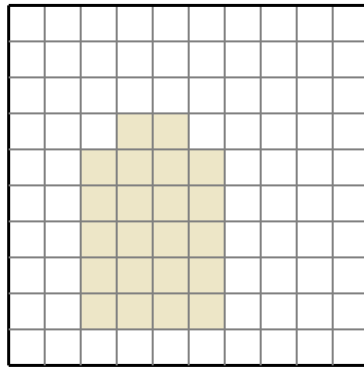
4)



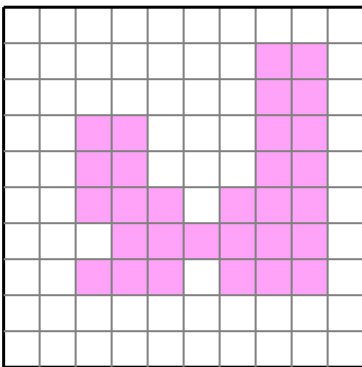
5)



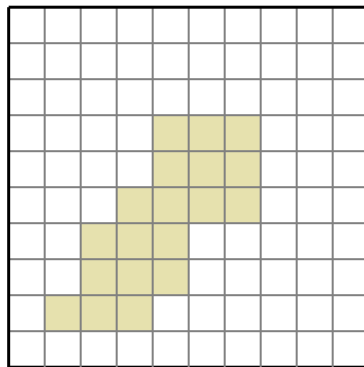
6)



7)



8)



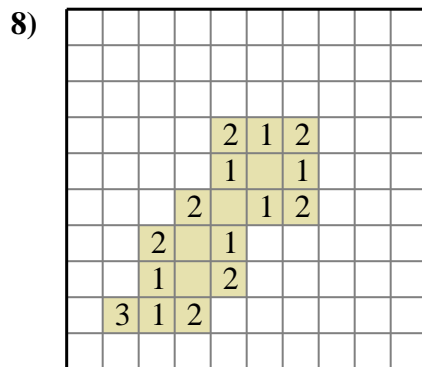
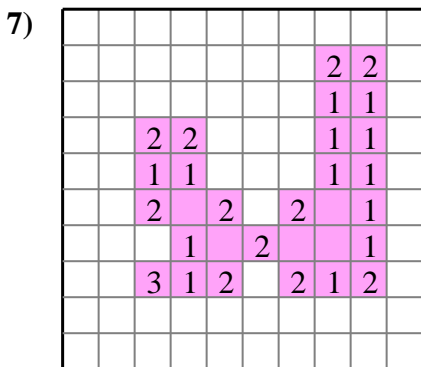
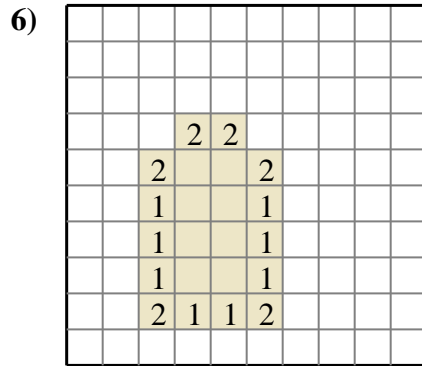
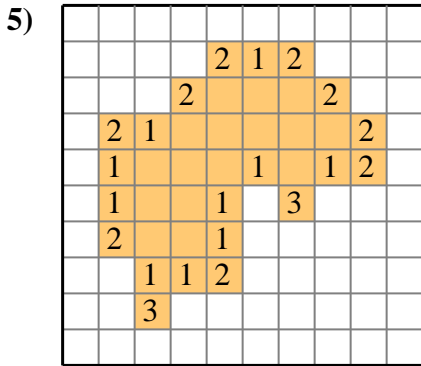
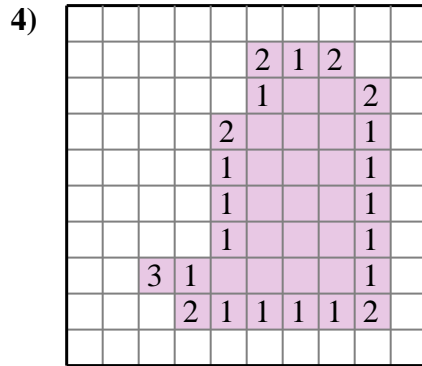
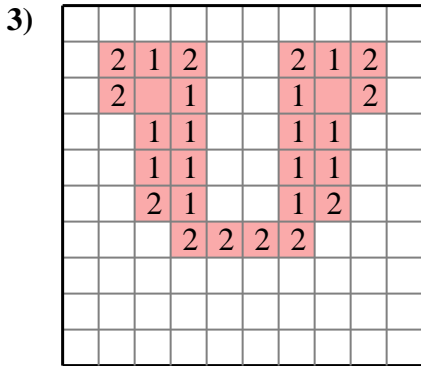
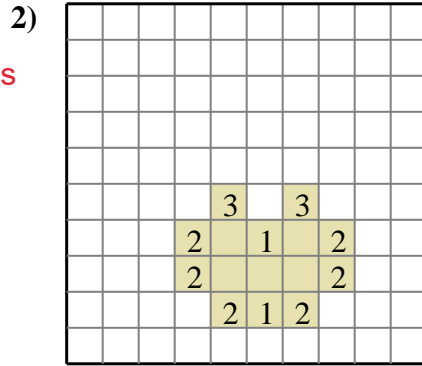
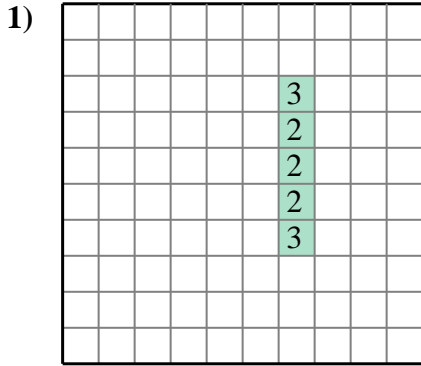
Answers

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_



Find the perimeter of each shaded section. Each block is 1 square unit (u).

5th Grade Printables



Answers

1. 12
2. 20
3. 38
4. 30
5. 34
6. 20
7. 38
8. 24

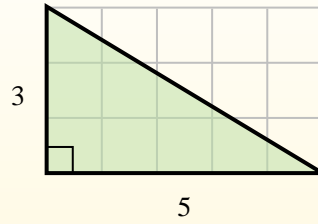
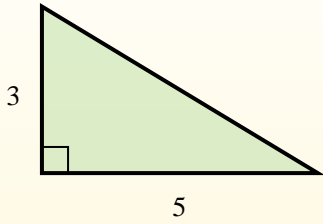


Find the area of each triangle in blocks (b).

Answers

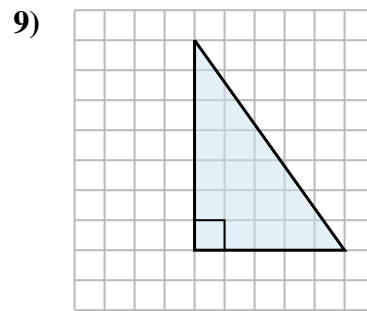
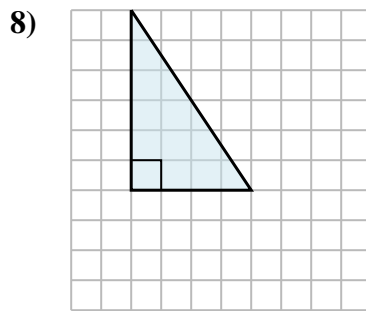
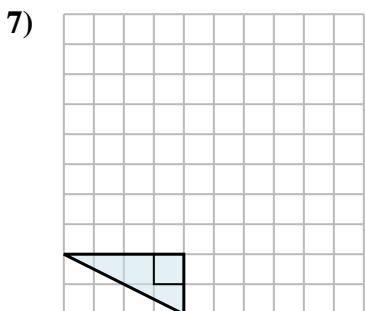
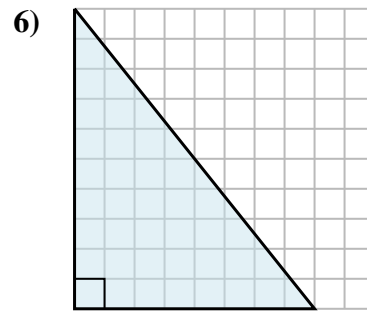
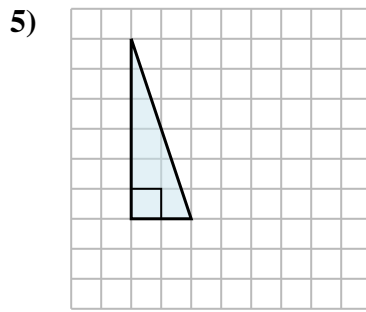
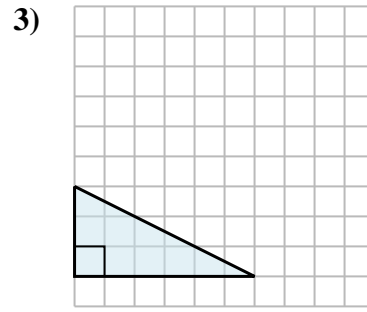
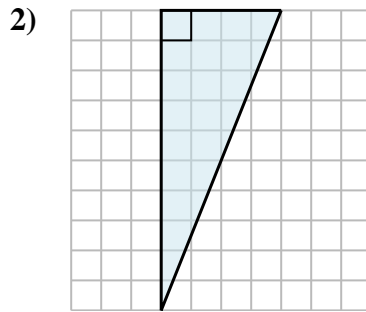
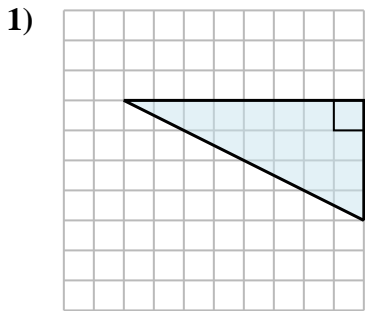
The area of a **right** triangle is half the area of the rectangle that would surround it.

In this example, the surrounding rectangle would have an area of 15 blocks ( $15 b^2$ ).



Half of 15 is 7.5  
This **right** triangle has an area of  $7.5 b^2$ .

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_





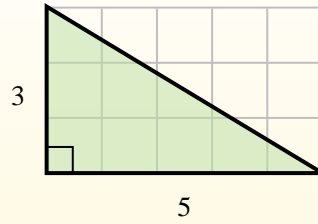
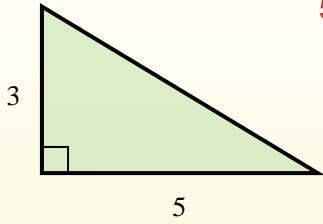
Find the area of each triangle in blocks (b).

Answers

The area of a **right** triangle is half the area of the rectangle that would surround it.

In this example, the surrounding rectangle would have an area of 15 blocks ( $15 b^2$ ).

5th Grade Printables



Half of 15 is 7.5  
This **right** triangle has an area of  $7.5 b^2$ .

1.  $16 b^2$
2.  $20 b^2$
3.  $9 b^2$
4.  $15 b^2$
5.  $6 b^2$
6.  $40 b^2$
7.  $4 b^2$
8.  $12 b^2$
9.  $17.5 b^2$

