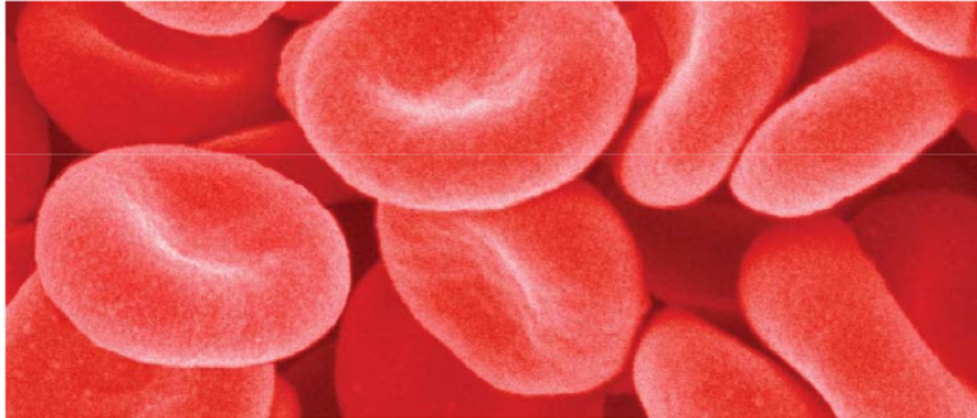


## Practice: Explore Surface Area



### Materials

- small disks or pennies
- small boxes or dominoes

### surface area

- the sum of the areas of all the faces of an object

Red blood cells are the shape of very tiny disks. They have a thickness of 2.2 microns and a diameter of 7.1 microns. A micron is another term for a micrometre—one millionth of a metre. Red blood cells absorb oxygen from the lungs and carry it to other parts of the body. The cell absorbs oxygen through its surface.

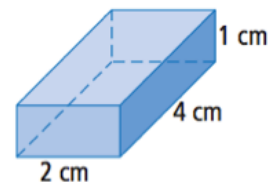
The disease multiple myeloma causes the red blood cells to stick together. How would this affect the **surface area** of the cells?

## Explore Symmetry and Surface Area

- Use a small disk to represent a single red blood cell. Estimate the surface area of the disk.
  - Stack four disks. Estimate the surface area of the stack of disks.
  - How did you estimate the surface area for parts a) and b)? Compare your method of estimation with your classmates' methods.
  - How does the total surface area of the four separate disks compare to the surface area of the four stacked disks? By what percent did the total surface area decrease when the disks were stacked?



- Some medicine is shipped in small boxes that measure 1 cm by 4 cm by 2 cm. Six boxes are wrapped and shipped together. Working with a partner, use models to help answer the following questions.



- If the arrangement of the six boxes must form a rectangular prism, how many arrangements are possible?

## Practice: Explore Surface Area

- b) The cost to ship a package depends partly on total surface area. Would it be cheaper to ship the boxes in part a) individually, or wrapped together in plastic? If you wrapped the boxes together, which arrangement do you think will cost the least to ship? Explain.

3. You want to waterproof a tent. You need to determine the surface area of the tent's sides and ends to purchase the right amount of waterproofing spray. You do not have to waterproof the bottom. Calculate the surface area. Give your answer to the nearest tenth of a square metre.



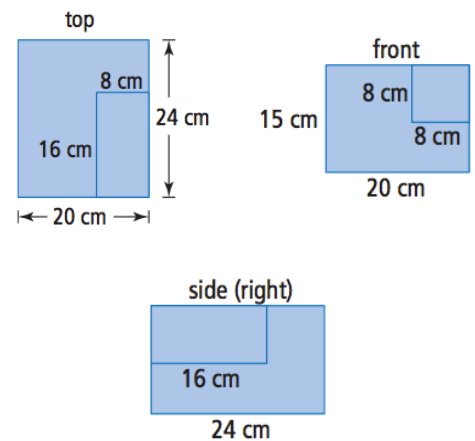
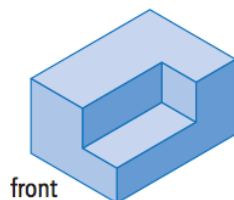
How can you use the Pythagorean relationship to find the dimension for the tent's sides?

## Reflect and Check

4. How can symmetry help you find the surface area in each of the three situations? Explain.
5. How does the surface area of a composite object compare with the sum of the surface areas of its separate parts? Explain.

## Calculating Surface Area of a Solid

Consider the solid shown, in which all angles are right angles.



- a) What are the dimensions of the cutout piece?  
 b) What is the total surface area of the solid?