

Name _____

Pick a Project

Project 11A

Florida Skyscrapers

To get an amazing view of your surroundings, head to the top of a skyscraper. A skyscraper is a tall building. Most of Florida's skyscrapers can be found in the city of Miami. Among the many



skyscrapers there, six of them are the tallest buildings in all of Florida. The tallest of those is known as the Panorama Tower, which is 265 meters (868 feet). It has 82 floors!

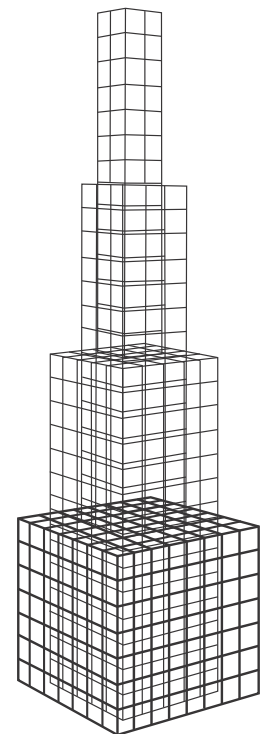
The first building to be described as a skyscraper was the Home Insurance Building. It was built in 1884. It had just 10 floors, which was very tall at the time. Today, the tallest building is the Burj Khalifa in Dubai. It has 163 floors. Advances in materials, such as concrete, steel, and glass, make taller buildings possible. One of the most important advances was the invention of the elevator. Imagine having to walk up all those flights of stairs if there were no elevators.

Your Project Build a Skyscraper with Unit Cubes

The taller the building, generally the more volume there is inside it. The volume inside modern skyscrapers is filled with offices, hotels, restaurants, stores, apartments, and more. Build a model of a skyscraper with unit cubes. You may copy a skyscraper that you've seen or design it yourself.

Decide the number of feet or meters represented in your model by one side, s , of a unit cube. For example, if $s = 40$ feet and your model has a height of 10 unit cubes, the real skyscraper would have a height of 400 feet.

Once you've built your model, sketch your design on white paper. Find its volume in the units represented by s . Label the real-world dimensions on your design and explain your calculations to a small group of students. Display your design in your classroom. Mention what you would want inside your skyscraper.



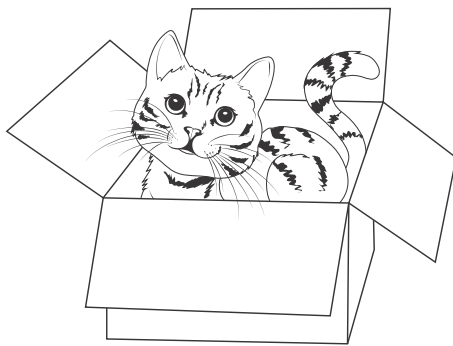
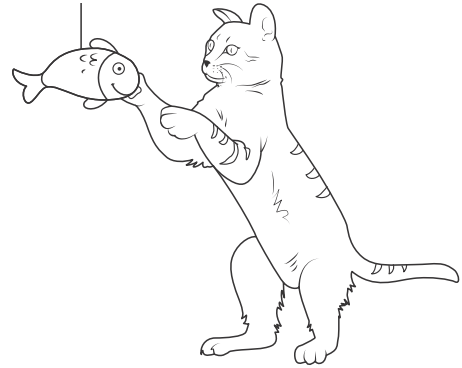
Name _____

Pick a Project

Project 11B

Curious Cats

In and out. Up and down. Cats are curious animals and love to explore their surroundings. Not only do they examine every square inch of the floor, they peep under beds, crawl inside drawers, and climb up to the very tops of refrigerators and bookshelves.

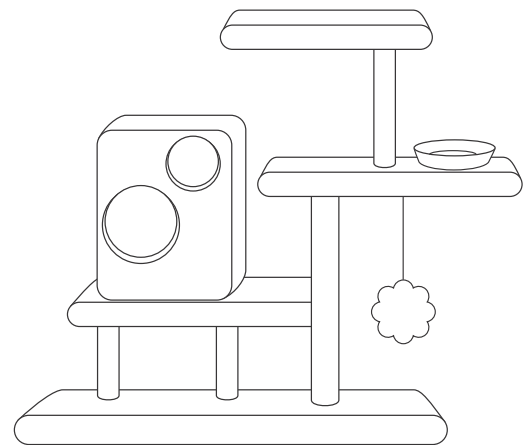


One object that cats are famous for exploring is a box. Cats are known for squeezing themselves into boxes that seem much too small. Studies have shown that climbing into a closed space, such as a box, can make a cat feel calmer. Another reason is that cats are careful animals. A cat might climb into a box to make sure there is a place to hide if needed. A third reason is that cats like warmer spaces than most humans. Cuddling up in a box might just keep a cat warm.

Your Project Design a Cat Tree

A cat tree is an object that gives cats safe places to play, climb, sleep, and hide. A cat tree usually has posts, flat places, and holes into which cats can crawl much as they would in a box. On a sheet of paper, design a cat tree. Make sure a cat could climb or jump to the very top of your cat tree. There should be at least two places in the shape of rectangular prisms where a cat could hide. Make your cat tree tall, but not so tall that it touches the ceiling.

Write a summary to include with your design. Include the length and height of the cat tree.



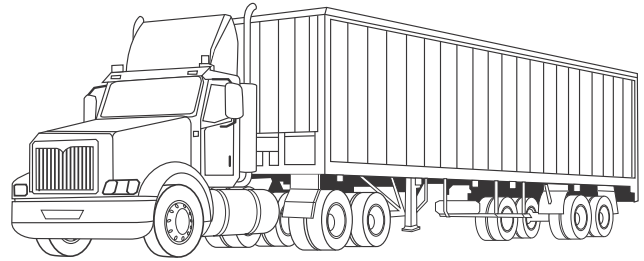
Name _____

Pick a Project

Project 11C

Trucks

With a few clicks on the computer keyboard, a new soccer ball is ordered. Just days later, the ball is delivered to your doorstep. How did it get there so fast? A large part of the answer has to do with trucks and the people who drive them. There are over 15 million trucks on the roadways of the United States.

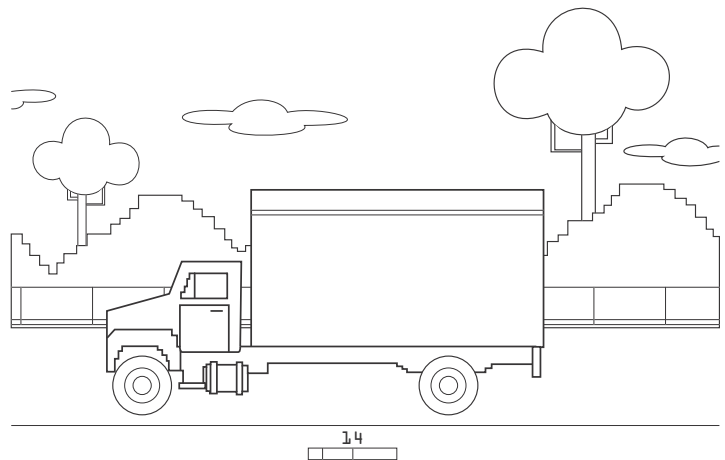


Trucks come in all different sizes depending on what they need to carry. Some larger trucks are known as 18-wheelers, semis, or tractor trailers. These trucks are generally about 53 feet long and a little more than 13 feet tall. They can carry up to 80,000 pounds, which is about as much as 25 average-sized cars. They can carry all sorts of items over long distances. Some trucks have refrigerators or freezers to keep food cold.

Other trucks are smaller. Box trucks and vans, for example, hold fewer items. They are often used to carry items over shorter distances.

Your Project Model a Truck's Capacity

A lot of planning goes into package delivery services. Suppose you are asked to analyze the transport of boxed packages in a new truck. Each of these new trucks measures 12 feet \times 6 feet \times 8 feet. Boxes are cubed-shaped with sides of either 1 foot, 2 feet, or 3 feet. You are paid \$5 to transport a 1-foot box, \$25 to transport a 2-foot box, and \$100 to transport a 3-foot box.



Using only grid paper, counting cubes, and a pencil, determine the following:

- How many boxes fill a truck when only one type of box is used?
- What combination of box types will result in the highest payment for one truckload?