

① Star Gazers

Dreams

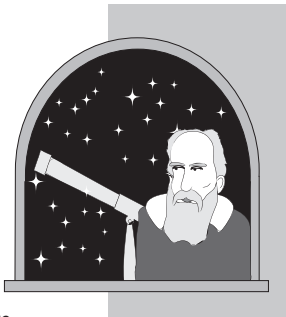


When you look up at the stars and imagine what it's like up there, you're doing what many, many people all over the world have done throughout history.

Tools



In 1609 Galileo was one of those curious scientists -- like you. He used a telescope to get a closer look and improved it so that he could see even better.



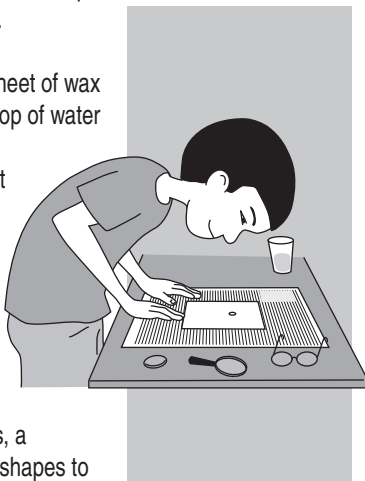
Adventure



You can make things look bigger than they really are.

You will need: newspaper, wax paper, clear plastic cups, water, lenses you can find around the house.

1. Place the newspaper on the table. Put a sheet of wax paper over the newspaper. Carefully put a drop of water on the wax paper -- just a drop.
2. Examine the writing on the newspaper that you can see through the drop of water. What do you notice? Study and record the shape of the drop of water.
3. Experiment with the clear plastic cups. What does the world look like when you look through the cups? What if you fill a cup with water and look through the water?
4. Find other lenses -- someone's eyeglasses, a magnifying glass, a camera -- compare their shapes to the drop of water.
5. If you looked inside Galileo's telescope, what would you expect to see? It takes two lenses to make a telescope, one to focus the light into a single point and one to magnify it.



② Fly Me to the Moon

Dreams

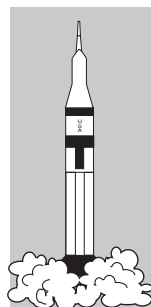


So now that you have your telescope and you can see what's up in the sky, wouldn't you like to travel there?

Tools



In 1969 scientists and engineers at NASA succeeded in getting a person to the moon, but they had to build a very powerful rocket to get there.



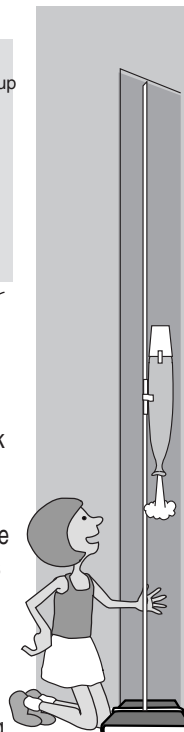
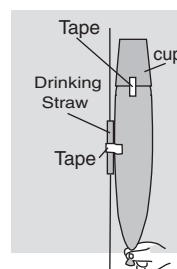
Adventure



You can build your own rocket and overcome the force of gravity.

You will need: packing tape, oblong shaped balloon, paper cup, plastic drinking straw (2" section) a friend for a lab partner, 12' piece of string, clear tape, scissors, hardback book, 8 1/2" x 11" writing paper, paper clip.

1. Using packing tape, fasten one end of the string to the top of a doorframe.
 2. Blow up the balloon. Twist and hold the end of the balloon to retain the air once it is full.
 3. Have your friend tape the paper cup to the round end of the balloon.
 4. Slip the free end of the string through the 2" section of drinking straw.
- Tape the straw to the side of the balloon as shown.
5. Hold the free end of the string to the floor and wrap it around the book to hold the string in place. Pull the open end of the balloon down as close to the book as possible and release. Mark how high the balloon travels.
 6. The balloon "rocket" must overcome the downward pull of gravity. Gravity is a constant force. What other variables affect the distance the balloon rocket can travel? Select a variable such as amount of air in the balloon or the weight of the "cup capsule." Create a controlled experiment and record data.
 7. How does the "cup capsule" compare to a paper airplane? Fold your 8 1/2" x 11" paper into an airplane. Observe and record the strengths and weaknesses of these two ways of flying.



③ Living the Dream

Dreams

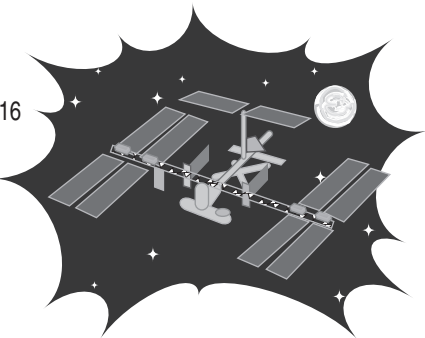


Space travel used to be a dream, but it's part of our life now. Would you like to live or work in space someday?

Tools



Today, astronauts and scientists from 16 countries work together on the International Space Station. But they have to adapt to life floating in space.



Adventure



You can create a mini space environment and experiment with microgravity.

You will need: shoe box, colored paper, old magazines, colored markers, scissors, tape, glue, very small action figure and vehicles.

1. Position the shoe box with the longest side up, not the way you would normally set it to put your shoes away.
2. Use the colored paper, cutouts from the magazines and the markers to decorate the inside of the shoe box so that it looks like the inside of the Space Station or outer space.
3. Glue or tape the paper and magazines to the sides of the box.
4. Put the action figures, vehicles and any other small items you like inside the box.
5. While holding the box so that you can see inside, jump into the air. Watch very carefully. What happens to the objects? Why?



④ Mission: Mars

Dreams

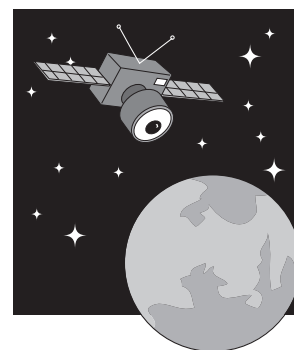


We've been to the moon, but now we're dreaming of a faraway planet we'd like to visit -- Mars.

Tools



Scheduled for 2005, the Mars Reconnaissance Orbiter will have very powerful cameras to view the planet's surface and look for safe landing sites for human exploration.



Adventure



You can simulate the atmosphere on Mars right in your own kitchen!

You will need: 2 plastic cups, vinegar, baking soda, short candle, matches, small lump of clay, adults

1. Pour some vinegar into one of the cups and sprinkle in baking soda. Believe it or not, you just made carbon dioxide. Do you know where it is?
2. Put a lump of clay in the bottom of the second cup. Stick the candle into the clay.
3. Ask some adults to light the candle. Tell them they can stick around if they want to learn about the magic of carbon dioxide. That should impress them.
4. What will happen if you tilt the vinegar/baking soda cup over the lit candle? Try it. Do not spill the vinegar.
5. Have the adult try to light the candle again. Any problems?
6. Could you light a fire on Mars?

