Adventures in Space

Family Back Pack #10

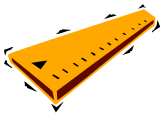
1.

Flying a Kite

Key Educational Point: The design for sled kite comes from experiments done to improve Parachutes.

If you could fly you would feel the winds that move the clouds. You may not be able to touch those high winds, but one way you can get a sense of them is to fly a kite. This kite is easy to make and always flies. It is called a sled kite.

Supplies needed:



- A yardstick
- A marker
- Scissors
- Two wooden dowels, 24 inches long and 1/8 inch in diameter (you can get these at any hardware store: tell the clerk exactly what you want)
- Duct tape
- A hole punch
- A new ball of string.

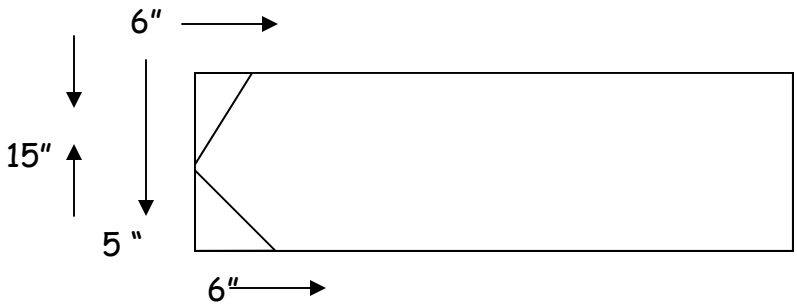
Directions

1. Clear a space on the floor or find a large tabletop where you can spread your plastic perfectly flat. The longer edges are the top and the bottom. The shorter edges are the sides. Fold over lower edges to make the kite 24" x 30" Tape the folds.
2. On the bottom edge of the plastic, measure in 6inches from one side and mark the plastic with a marker, then make another mark six inches from the other side.
3. Make the same marks on the top edge of the plastic.
4. Now along the edge of each side, measure down five inches from the top and bottom and make a mark. Use the yardstick to draw lines with the marker connecting the six marks you've made and you will have the six sided shape shown on the next page.

Flying a Kite

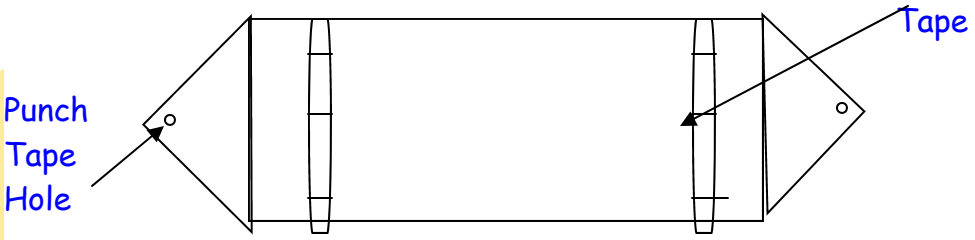
For the top and bottom so the kite is 24" x 3"

Top



Bottom

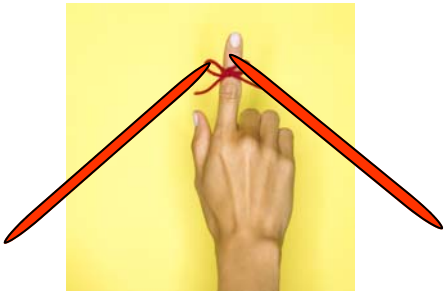
5. Cut out your six-sided piece of plastic with scissors. Lay the dowels down on the shape, from top to bottom, as shown in the picture.
6. Tape the dowels securely to the plastic with duct tape, making sure you tape down the top and bottom of the dowels and not just the middle.



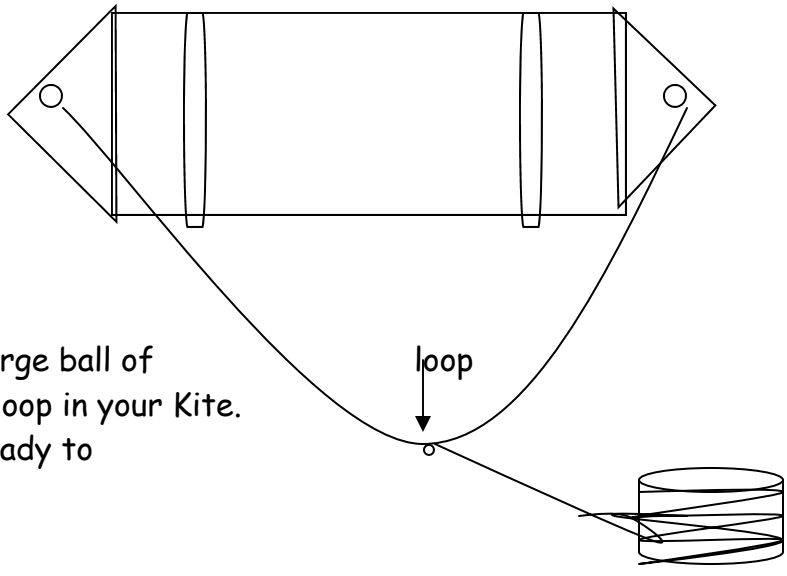
7. Cover the front and back of the two outside corners-the ones not connected by the dowels-with duct tape.
8. Punch a hole in each taped corner with the hole.
9. Now your Kite is ready for Kite strings. Measure and cut a three-foot length of string, Fold the string exactly in half and mark the fold with a marker.

Flying a Kite

10. With your forefinger on the mark, hold the string down on a tabletop and have a friend tie a knot with the string around your finger. When you take your finger out, there should be a loop in the middle of the string just like one in the picture.



11. Tie the two ends of the looped string to the holes you made at the corners of your kite. This string is called the bridle string. Now take the loose end of the ball of string and tie it securely to the loop in the bridle string.



12. Tie a large ball of
    to the loop in your Kite.
13. It is ready to
    fly!

Flying a Kite

It is windy day. A good day to fly a kite. (PS make sure it is not raining or snowing). The best winds for flying a kite are between four and fourteen miles per hour. Find a safe open place to fly your kite. "Safe" means a place with no trees, buildings, traffic, telephone wires or power lines. Playgrounds, parks , fields, and beaches are ideal.

To launch your kite, stand with your back to the wind. In one hand hold your kite in front of you by the bridle string: in the other hand, hold your ball of string. You will feel the wind pushing against the front of your kite, which will make you want to let go. Let out a little string from your ball and pull gently as the wind lifts your kite into the air.

The next step is to let out more and more string pulling a little at a time. Keep doing this until your kite is launched into the air. If it begins to fall, give the string a tug until it begins to rise again. If it falls to the ground, don't get upset or discouraged. As you practice you will learn how to keep the kite airborne for long lengths of time.

To bring your kite back to earth, reel in the string slowly and carefully. As the kite nears the ground, walk toward it as you bring it in. Soon it will be ten yards away, then five and the one. . . Then you can bring it in to fly another day.

Edible Rockets

Blast off to space with this delicious treat!

Explanation:

The Space Activity Center offers a great space recipe for kids called Edible Rockets. Now kids can eat nutritious food while having fun!

Supplies:



4 baby carrots
1 apple
Paring knife
1 banana & 1 large plate

Directions:

Peel and cut the banana in half and place it in the middle of your plate. The banana will be the body of your rocket.

Parent Alert: Use the paring knife to cut a few apple wedges to place below the body of your rocket. The apples will be your rocket fire.

Put two baby carrots on each side of the banana. The carrots will be the wings of the rocket.

Once you have all the pieces in place, you're ready for lift off so dig in!

Astronaut Pudding

1/8 cup any flavor instant pudding mix
1/4 cup milk

Directions:

Put both ingredients into a zip-type bag.

Close the bag securely. Gently knead mixture until pudding forms.

Snip off one of the corners and squeeze the pudding into your mouth.

Today's Robots

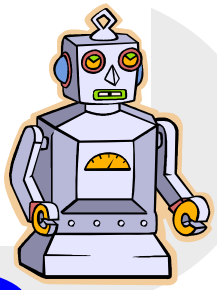
At present there are two main types of robots,: general-purpose autonomous robots and dedicated robots.
TOPIO, a humanoid robot can play ping-pong.] Robots can be classified by their specific purpose. A robot might be designed to perform one particular task extremely well, or a variety of tasks less well. All robots can be re-programmed to behave differently, but some are limited by their physical form. For example, a factory robot arm can perform jobs such as cutting, welding, gluing, or acting as a fairground ride, while a pick-and-place robot can only populate printed circuit boards.

General-purpose autonomous robots

General-purpose autonomous robots are robots that can perform a variety of functions independently. General-purpose autonomous robots typically can operate independently in certain spaces, handle their own re-charging needs, talk with electronic doors and elevators and perform other basic tasks. Like computers, general-purpose robots can "link" with networks, software and accessories that increase their usefulness. They may recognize people or objects, talk, provide companionship, monitor environmental quality, respond to alarms, pick up supplies and perform other useful tasks. General-purpose robots may perform a variety of functions simultaneously or they may take on different roles at different times of day. Some such robots try to mimic human beings and may even resemble people in appearance; this type of robot is called a humanoid robot.

Domestic robots and Industrial robots

There are more than one million robots in operation worldwide in 2008, with roughly half in Asia, 32% in Europe, 16% in North America, 1% in Australasia and 1% in Africa Industrial and service robots can be placed into roughly two classifications based on the type of job they do. The first category includes tasks which robots can do with greater productivity, accuracy, or endurance than humans; the second category



Today's Robots continued

consists of dirty, dangerous or dull jobs which humans find undesirable.

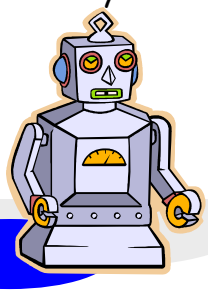
Some examples of factory robots:
Car production: Over the last 30 years automobile factories have become dominated by robots. A typical factory contains hundreds of industrial robots working on fully automated production lines, with one robot for every ten human workers. On an automated production line, a vehicle chassis on a conveyor is welded, glued, painted and finally assembled at a sequence of robot stations.

Packaging: Industrial robots are also used extensively for palletizing and packaging of manufactured goods, for example for rapidly taking drink cartons from the end of a conveyor belt and placing them into boxes, or for loading and unloading machining centers.

Electronics: Mass-produced printed circuit boards are almost exclusively manufactured by pick-and-place robots, typically with manipulators, which remove tiny electronic components from strips or trays, and place them on to PCBs with great accuracy Such robots can place hundreds of thousands of components per hour, far out-performing a human in speed, accuracy, and reliability.

Automated guided vehicle carrying medical supplies and records: Mobile robots, following markers or wires in the floor, or using vision or lasers, are used to transport goods around large facilities, such as warehouses, container ports, or hospitals

Early AGV-Style Robots were limited to tasks that could be accurately defined and had to be performed the same way every time. Very little feedback or intelligence was required, and the robots needed only the most basic exteroceptors (sensors).



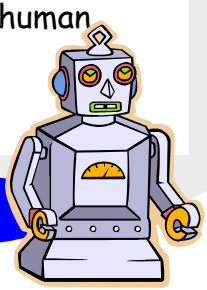
Today's Robots continued

Interim AGV-Technologies developed that deploy triangulation from beacons or bar code grids for scanning on the floor or ceiling. In most factories, triangulation systems tend to require moderate to high maintenance, such as daily cleaning of all beacons or bar codes. Also, if a tall pallet or large vehicle blocks beacons or a bar code is marred, AGVs may become lost. Often such AGVs are designed to be used in human-free environments.

Newer AGVs such as the "Speci-Minder, ADAM, Tug and Patro lBot Gofer are designed for people-friendly workspaces". They navigate by recognizing natural features. 3D scanners or other means of sensing the environment in two or three dimensions help to eliminate cumulative errors in dead-reckoning calculations of the AGV's current position. Some AGVs can create maps of their environment using scanning lasers with simultaneous localization and mapping and use those maps to navigate in real time with other path planning and obstacle avoidance algorithms. They are able to operate in complex environments and perform non-repetitive and non-sequential tasks such as transporting photo masks in a semiconductor lab, specimens in hospitals and goods in warehouses. For dynamic areas, such as warehouses full of pallets, AGVs require additional strategies. Only a few vision-augmented systems currently claim to be able to navigate reliably in such environments.

The job may be boring, such as domestic cleaning, or dangerous, such as exploring inside a volcano. Other jobs are physically inaccessible, such as exploring another planet, cleaning the inside of a long pipe, or performing laparoscopic surgery.

Telerobots: When a human cannot be present on site to perform a job because it is dangerous, far away, or inaccessible, teleoperated robots, or telerobots are used. Rather than following a predetermined sequence of movements, a telerobot is controlled from a distance by a human operator. The robot may be in another room or another country, or may be on a very different scale to the operator.



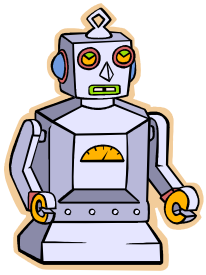
Today's Robots continued

Forinstance, a laparoscopic surgery robot allows the surgeon to work inside a human patient on a relatively small scale compared to open surgery, significantly shortening recovery time. When disabling a bomb, the operator sends a small robot to disable it. Several authors have been using a device called the Longpen to sign books remotely. Teleoperated robot aircraft, like the Predator Unmanned Aerial Vehicle, are increasingly being used by the military. These pilotless drones can search terrain and fire on targets Hundreds of robots such as iRobot's Packbot and the Foster-Miller TALON are being used in Iraq and Afghanistan by the U.S. military to defuse roadside bombs or Improvised Explosive Devices (IEDs) in an activity known as explosive ordnance disposal (EOD).

Automated fruit harvesting machines: are being used to pick fruit on orchards at a cost lower than that of human pickers.

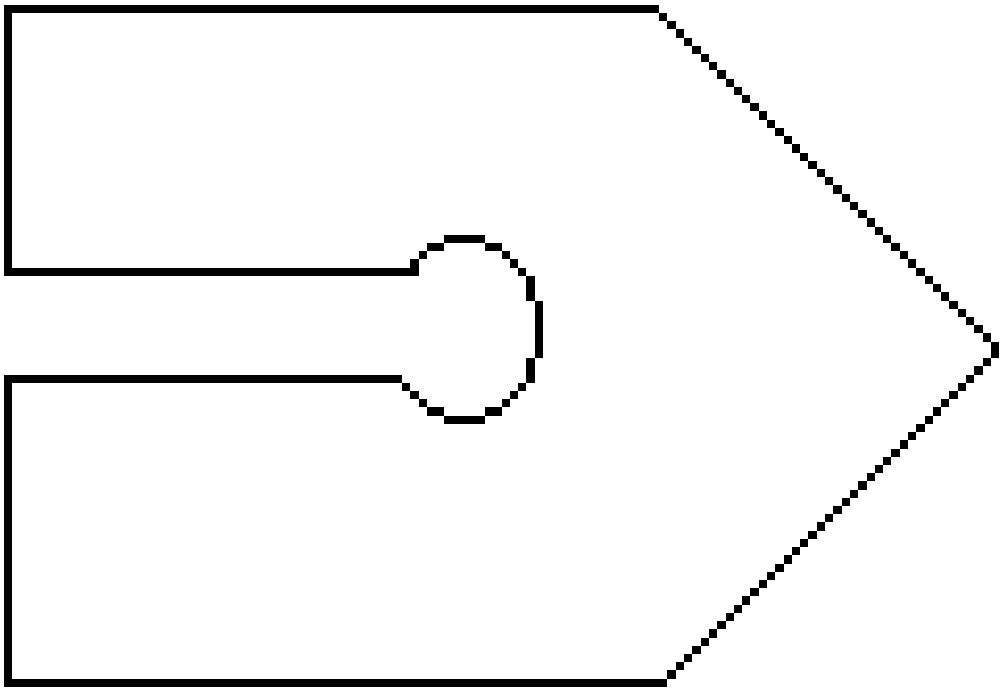
The Roomba domestic vacuum cleaner robot does a single, menial job. In the home: As prices fall and robots become smarter and more autonomous, simple robots dedicated to a single task work in over a million homes. They are taking on simple but unwanted jobs, such as vacuum cleaning and floor washing, and lawn mowing. Some find these robots to be cute and entertaining, which is one reason that they can sell very well.

Elder Care: The population is aging in many countries, especially Japan, meaning that there are increasing numbers of elderly people to care for, but relatively fewer young people to care for them. Humans make the best careers, but where they are unavailable, robots are gradually being introduced.



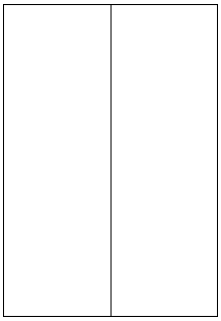
Rocket Ship Experiement

1. Cut out the shape shown in from lightweight cardboard, the kind used in cereal boxes. This shape should be about 1 inch long.
2. Place the rocket on the surface of a sink full of pure water (there must be no soap in the water so rinse the sink out once first). Now drip some washing up liquid into the hole in the center of the rocket cut out. The rocket should shoot across the water.
3. This is showing the effect of surface tension. At the back of the rocket where the washing up liquid exudes the surface tension becomes zero but it is still high elsewhere around the rocket. Therefore the resultant force propels the rocket forward. The sink will have to be emptied and refilled before you do this again.

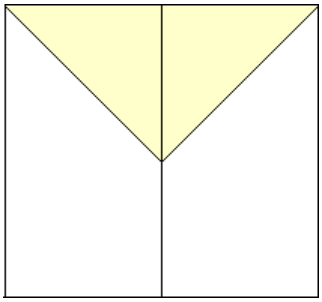


Paper Airplane (folding instructions)

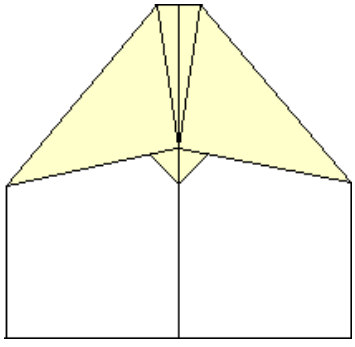
1. First fold the sheet in half along the line shown in and then open it out again.



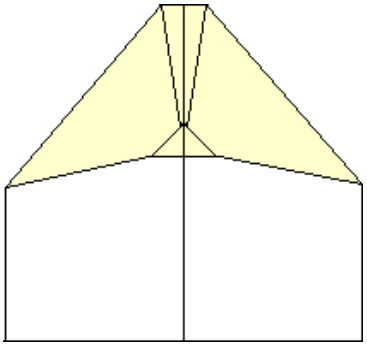
2. Fold the two top corners in to the center line to give the form.



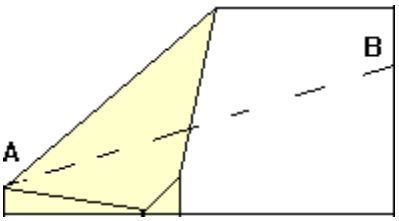
3. Then fold the top large triangle over so that the two flaps formed in step 2 are underneath the large triangle. Your paper should now look like this.



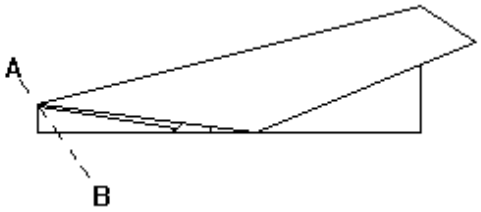
4. Now fold the small triangle up over the two flaps to give it support.



5. Fold along the center line so that the small triangle is on the underside of the plane on the outside along with the two flaps as shown in the

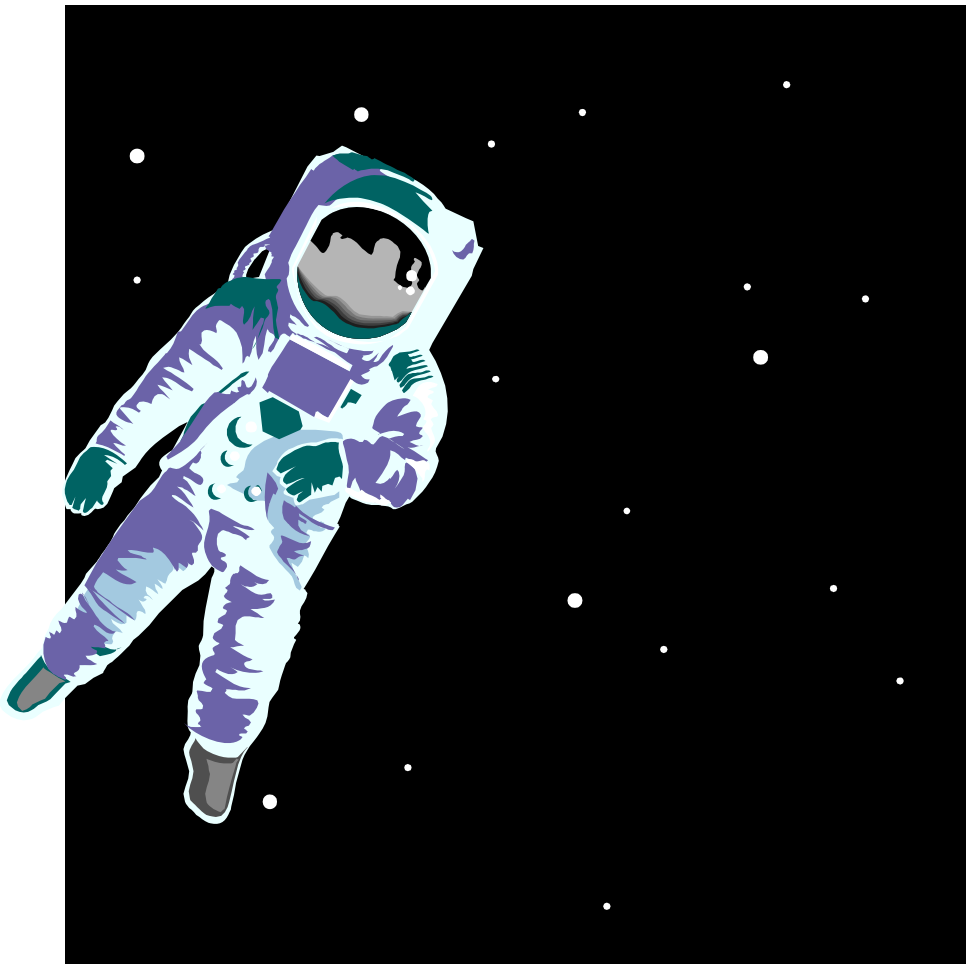


6. Fold along the line AB on then turn the plane over and do the same to the Other side producing this figure.

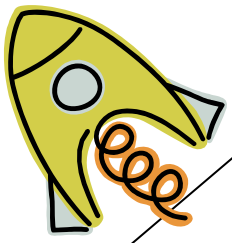


7. Fold along the line labeled AB on the diagram first one way and then the other creasing really well. Tuck the triangular shaped depression in between the two wings to produce. This stabilizes the plane.

Now you are ready to test it out in the air. Have fun!



Directions: A game for 2-4 players. Place board together with numbers spaces facing up. Distribute astronaut game pieces and place them on the launch pads. (If players are missing you can use buttons, Marconi, or other small items as pieces). Stack question/answer cards face-down beside the game board. The youngest person goes first. The player sitting to the left of Player 1 draws a card and reads it aloud. A correct answer lands player 1 on his/her first square. After each player takes a turn, he or she then reads a card for the next player. Play moves clockwise. A correct answer allows a player to advance one square up the path to the spaceship. The first player to arrive at his or her spaceship wins.



Launch Pad

1

2

3

4

5

6

7

8

9

9

8

7

6

5

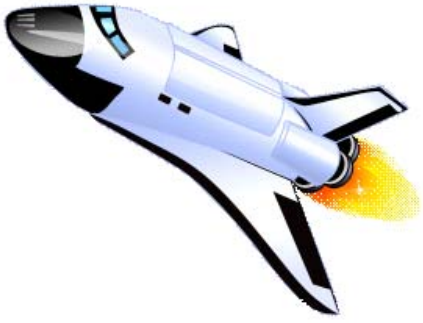
4

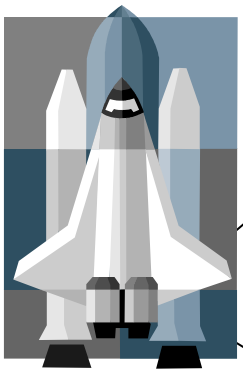
3

2

1

Launch Pad





Launch Pad

1

2

3

4

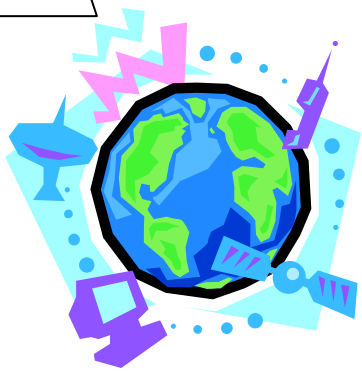
5

6

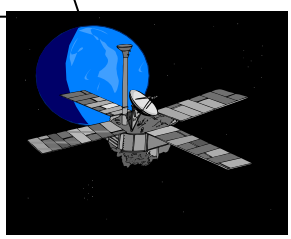
7

8

9

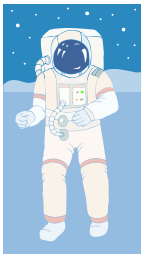


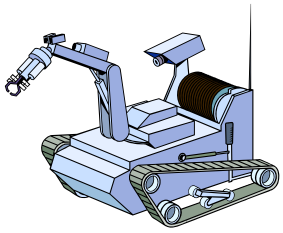
Launch Pad



Optional Game Pieces

(Note: Mount players and cards on cardboard before cutting out to add strength the pieces of the game).





Questions. and Answers. Cut out square and place cards face down.			
What plants make up the inner solar system? Mercury, Venus, Earth & Mars	The solar system is located in what galaxy? The Milky Way	What planet makes up the outer solar system? Jupiter, Saturn, Uranus, Neptune	True/False The solar system is mostly empty space. True
Who was the first American Woman in space Dr. Sally Ride	Which planets are largely made of gaseous material? Jupiter, Saturn Uranus Neptune	Which planets our known as “ice giants”? Uranus and Neptune	True/False: All planets orbit in the same direction as the sun rotates. True
Which planet takes the shortest time to orbit The sun? Mercury	Which of the following is not part of the inner solar system: Venus, Mars, Saturn or Mercury? Saturn	True/False: Gravity helps keep the planets in orbit. True	True/False: At one time it was thought that our solar system had 9 planets. True
True/False, There is a connection between the planets’ names & Greek mythology. True	What asteroid was once thought to be a planet and is now know to be a dwarf planet? Pluto	The earth’s water is known as the _____.. Hydrosphere	It takes 365 days for the earth to _____ Orbit around the Sun.

True/false The sun is not part of our solar system. False	Which planet is the 5th largest? Earth	What is the only natural satellite of the earth? Moon	Which planet is the 4th closest to the sun? Mars
Which planet is the 7th largest? Mars	Which planet is the 5th largest? Jupiter	Which planet is the largest of all our planets? Jupiter	Which planet is the 4th closest to the sun. Saturn
Which planet is the 2nd largest? Saturn	Which planets the 7th closet to the sun? Uranus	Which planet is the 3rd largest? Uranus	Which planet is the 8th closest to the sun? Neptune
Which planet is the 4th largest? Neptune	Which planet is the smallest? Mercury	What is a comet? A mixture of ices & dust that weren't incorporated into other planets when the solar system formed.	Who was the first man on the moon? Neil Armstrong
What is the solar system? The Sun & all of the objects traveling around the sun.	What is gravity? The pull of force of attraction between one object & another.	What is our hydrosphere? The earth's Water.	Who was the first American in space? Alan B Sheppard Jr.

How many planets are there in our solar system 8	What is the lithosphere? The outer layer of the earth.	What makes the surface of Mars Red? Rust -also called iron oxide	What makes up the top layer of Earths lithosphere and is rocky The Crust
What is the name of the path a planet travels around the sun? Orbit	Name the planets in our Solar system Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune	How long does it take the earth to orbit the sun? 1 year	What helps keep the planets in orbit? Gravity
Gravity depends on two types of measurements. What are they? Mass and distance	True/False/ The earth has more mass then the sun. False	What is the3rd planet from the Sun? Earth	True/False: the earth's orbit is like an oval, not a circle. True
What is Earth's nearest neighbor? The Moon	Does the moon have a hydrosphere? No	Does the moon have a lithosphere? Yes	What is a meteorite? A chunk of rock form space that strikes the surface of the earth, any other planet, or the moon.
Which planet is closes to the sun? Mercury	Which planet is the 8th largest? Mercury	Which planet is the 2nd closest to the sun? Venus	Which planet is the 6th largest? Venus

What is an asteroid? Any small rocky space object	What is another name for an asteroid? Planetoid	What is a crater? A hole caused by an object hitting the surface of a planet or moon	What is the age of the earth? More than 4.5 billion years old.
Which planet in the solar system has the largest volcano? Mars	What is the largest volcano on earth? Mauna Loa in Hawaii	Which planet in the solar system is the heaviest? Jupiter	Where is the larget canyon in the solar system? On Mars
True/False: Saturn is larger than Jupiter False	Where is the geographic center of the United States? Butt County, South Dakota.	What is the temperature of Venus? 500 Degree F	Are the oldest rocks on Earth found on land or on the ocean floor? Land
True/False Mars has greater surface gravitational force than Earth. False	What is the coldest continent on planet Earth? Antarctica	What is the earth's highest mountain above sea level? Mr. Everest	What percentage of the earth's water is in its oceans? 97%
How much water is used in the United States each day? 400 billion gallons	True/False: Most of the earth's volcanoes are located on the sea floor. True	True/False: Pluto is the last planet in our solar system. False	What two land masses possess the majority of Earth's Fresh Water Supply? Greenland and Antarchica

What is the largest ocean on planet Earth? Pacific Ocean	True/False: Mars is larger than Earth. False	Does Earth or Mars have more moons? Mars	What is the earth's largest island? Greenland
What is a dwarf planet An object that orbits the sun and is large enough to have its own gravity but is not a planet.	What is the origin of the word "planet"? From the Greek world for "wanderer"?	Desert occupies what fraction of Earth's land surface? One-third	You are boarding your space ship. Move ahead one space
You hit Space Rocks, go back one space	You left your space glove in space. Go back one space to get it.	You landed on the moon successfully. Move ahead one space,	You join the Space team go ahead two spaces.