National Aeronautics and Space Administration

SPACE SCHOOL MUSICAL

ACTIVITY GUIDE

A KidTribe Production

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TABLE OF CONTENTS

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Space School Musical is a partnership between NASA's Discovery and New Frontiers Programs and KidTribe. Kellee McQuinn created, wrote and directed the musical. Kellee and Dr. Gale K. Gorke created and wrote the Activity Guide. Shari Asplund, Discovery and New Frontiers Education and Outreach Manager, oversaw development and production of the musical and the accompanying guides.

Learn more @ **http://discovery.nasa.gov** and **http://kidtribe.com**

S-P-A-C-E

ACADEMIC ACTIVITY

S to the P to the A-C-E...

This is what a Super Student Should Be!

Whatcha Need:

Mission Time: 30 minutes

Notebook or graph paper, pen or pencil

Whatcha Do:

MISSION:

Identify the characteristics of students who are successful in school by creating an acrostic poem.

PROCEDURE:

- Write "A SUPER STUDENT IS" vertically and in all CAPITAL letters along the left margin of the paper.
- Each line of the poem starts with a word that has the same letter as the phrase.
- Brainstorm a list of words that would describe the characteristics of students who are successful in school.
- Identify words that begin with each of the letters in the phrase.
- Write either a full sentence or a single word that describes the characteristics of a "super student".
- Decorate poems with illustrations, creative lettering, or other art that reflects the characteristics of a *Super Student.*
- Share the poems by reading out loud with the group, post for others to read, and/or bind in a "class" book.

S-P-A-C-E

A-

S-
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S-
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S-P-A-C-E

ARTS ACTIVITY

Super Student Mission Patch

Whatcha Need:

Mission Time: 30 minutes
Mission Patch Handout, pen, pencil, markers, colored pencils, and/or crayons, sample mission patches @ **http://www.hq.nasa.gov/office/pao/History/mission_patches.html**

Whatcha Do:

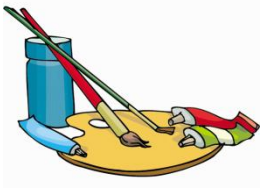
MISSION:

Create a "mission patch" that visually represents four important characteristics of a "super student."

PROCEDURE:

- Determine the characteristics of a *Super Student* by answering the following questions.
  - What are some tools that a *Super Student* uses?
  - What motivates a *Super Student*?
  - What do *Super Student's* do when faced with challenges?
  - What are the results of a *Super Student's* hard work?
- Determine which four characteristics are the most important.
- Create a symbol for each of the four characteristics.
- Use the patch template to draw and color the four symbols that best represent what makes a *Super Student.*

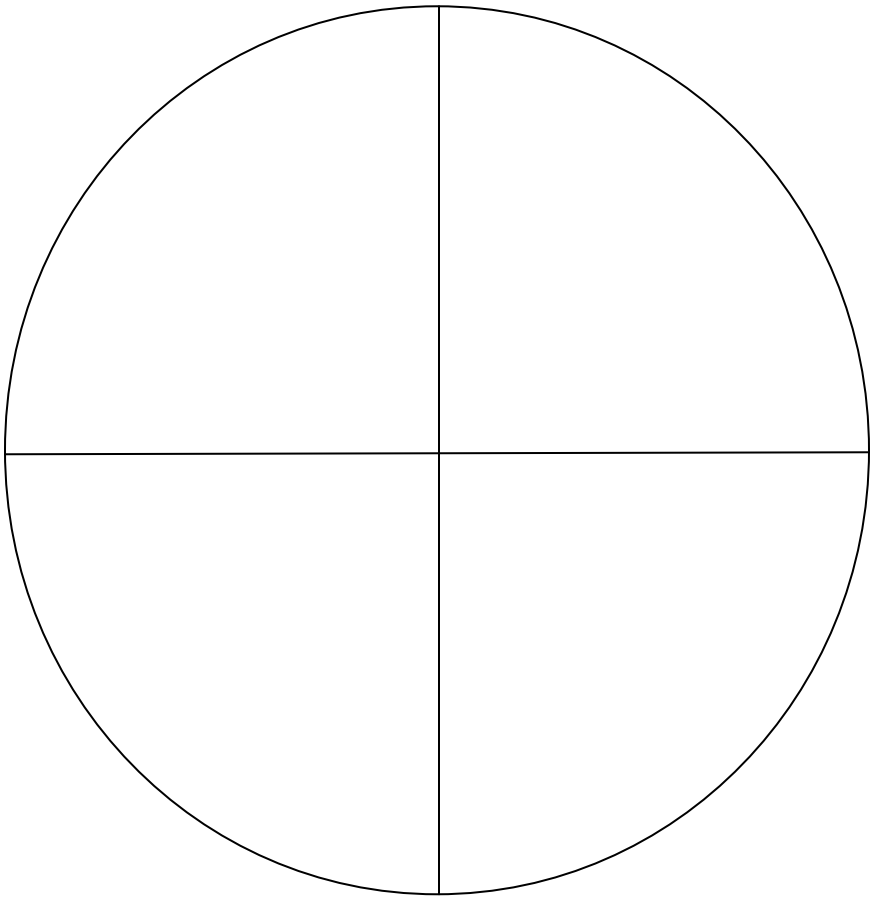
S-P-A-C-E



Mission Patch Handout

DIRECTIONS:

- Brainstorm characteristics of *Super Student.*
- Select the four you feel are most important.
- Create a symbol or picture of each characteristic.
- Place one symbol representing a characteristic in each of the quadrants (four sections) of the "patch" below.



S-P-A-C-E

FITNESS ACTIVITY

Super Student Tag

Whatcha Need:

Mission Time: 15-30 minutes
Large dedicated space, with a specific area identified as the "Library"

Whatcha Do:

MISSION:

Create super students who are physically fit.

PROCEDURE:

- Designate a large playing area to be the "Library."
- Choose someone to be the *Super Student*, who sits in the "Library" finishing his or her science project.
- The other players enter the "Library," trying to entice the *Super Student* to forget about the project and go outside and play with them.
- The *Super Student* catches or tags the other players within the boundaries of the "Library. "
- Any player the *Super Student* tags also becomes a *Super Student* and helps catch the remaining players who return again and again to coax the *Super Students* to come out and play.
- The last player caught is the winner and may be the *Super Student* the next time the game is played.

S-P-A-C-E

LIFE SKILLS ACTIVITY

Super Student Survey

Whatcha Need:

Mission Time: 30 minutes
Super Student Survey Handout, pen, pencil, crayons, and/or colored pencils, plain white paper or graph paper, compass, and ruler

Whatcha Do:

MISSION:

Conduct a survey, collect data, and represent it in a pie graph.

PROCEDURE:

- Follow the format in the Super Student Survey Handout to create a survey that will be used to measure what others (family, fellow students, teachers, etc.) think are the most important characteristics for a student to be successful.
- Give the survey to lots of the people in your life.
- Using the handout, record the data collected from the survey.
- Create a graph to represent that data.

S-P-A-C-E

Super Student Survey Handout

DIRECTIONS:

- Create a list of the characteristics or skills you think a "super student" has. (You can get some ideas from watching how Hannah behaves in ***Space School Musical.***)
    - Examples: organized, hard working, creative, determined, finds resources, follows directions, etc.
- Ask your friends, family, teachers, etc. if they have any other ideas and add them to the list.
- Once you have created the list, survey your friends, family, teachers, etc. to rank the list from ***most important to least important*** characteristic or skill. Be sure to keep track of who you surveyed and how many were friends, family, teachers, etc.

Super Student Characteristic Survey	
Name:_____	
Directions: Please rank the following characteristics of a *Super Student*, from ***most important to least important***. (most important- 4, least important 1)	
Characteristic	**Rank**
Organized	3
Hard working	4
Finds resources	1
Creative	2

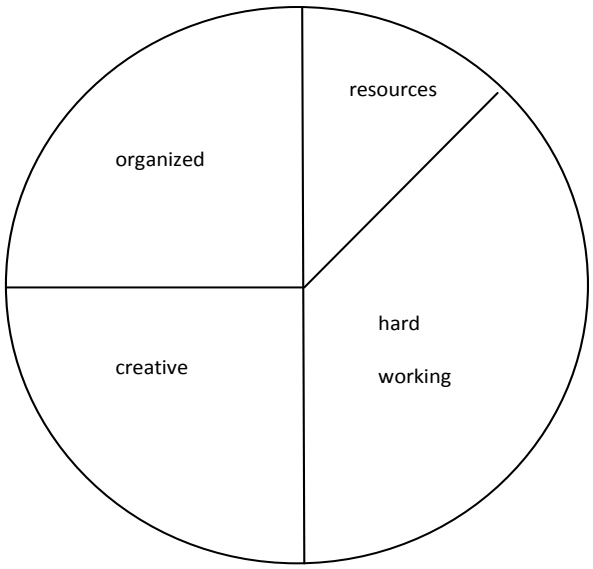
S-P-A-C-E

Super Student Survey Handout

- Place your data in a grid and total the responses to your survey. For each person surveyed, place the way they ranked the characteristics or skills on the chart.

Super Student Characteristic Grid				
Characteristics	**Organized**	**Hard working**	**Finds resources**	**Creative**
Mom	2	3	1	4
Mrs. Jones	3	4	2	1
Billy	2	4	1	3
Sarah	3	4	1	2
Total	10	15	5	10

- Based on the data you collected, create a pie graph that represents your findings. The higher the score, the more of the pie!



PLANETARY POSSE

ACADEMIC ACTIVITY

Interplanetary Travel Brochure

Whatcha Need:

Mission Time: 45 minutes
Travel Brochure Template, plain white paper, crayons or colored pencils, glue, sample travel brochures (if possible). Planet information for research notes available @ **http://solarsystem.nasa.gov/planets/index.cfm**

Whatcha Do:

MISSION:

Learn and share characteristics of the planets in our solar system.

PROCEDURE:

- Watch or listen to *Planetary Posse.*
- Select a planet and research the following information.
    - Description
        - Size, temperature
        - Visual features (what it looks like)
        - Composition (water, gases, rock, metals, etc.)
    - Distance from the Sun
    - Moons, if any
    - Orbit time
    - Length of day (rotation)
    - Proximity to other planets
- Write descriptions that illustrate the characteristics of the planet that would encourage others to visit.
- Create a brochure, using the Travel Brochure Template as an example.
- Decorate the brochure, using a variety of materials.
- Pretend to be a Travel Agent and present the planet's finest features to the class, trying to convince others to visit.

Fun Planet Fact

Pictures of various activities available on the planet for tourists

Caption describing picture above

Interplanetary Travel Brochure Template

Travel Agency Name

Street Address
City, State, Zip Code
Phone Number
Fax Number
E-mail address
Website

Your company logo

PLANET NAME

Planet nickname or famous features

Planet Photo

Creative saying that will interest people in visiting this planet.

Planet Slogan or Rhyming Phrase...

Picture of planet's unique physical features

Caption describing picture above

Planet Characteristics

When readers open the brochure, this is the first text they will see, making this a good place to briefly but effectively summarize the best features of your planet.

Make this text interesting so that readers will want to read the rest of the brochure.

Include:

- Size
- Color
- Temperature
- Orbit and rotation speed
- Visual features
- Planet composition
- Distance from the Sun

Reviews

- Three testimonials from previous tourists

Photo of happy tourists on the planet

Caption describing picture above

Tour Features

- Views of Moons, etc.
- Trip includes...
- Sightseeing of physical traits of planet
- Description of food and lodging
- Costs for trip
- Anything else you can think of...

Reservation Information

Clear instructions for making reservations to visit the planet.

PLANETARY POSSE

ARTS ACTIVITY

Solar System Sculpture

Whatcha Need:

Mission Time: 45 minutes
Solar System Sculpture Handout, compasses, molding clay, or clay from recipes (allow additional time if using recipes), paper plates, paints, water colors, or markers

Whatcha Do:

MISSION:

Create a solar system sculpture representing each of the planets' characteristics. Learn the size of the planets and compare them to Earth.

PROCEDURE:

- Using the Solar System Sculpture Handout, create clay replicas of each of the planets in our solar system.
- Shape and color the planets and then arrange them in "orbit" around the Sun.

PLANETARY POSSE

Solar System Sculpture Handout

Directions:

- Use a compass to draw circles on a paper plate:
  - one in the center for the Sun, with a radius of 4 cm
  - one for each of the planets, with the following radiuses, placing them in the correct order from the Sun

Planet	Radius
Mercury	0.3 cm
Venus	0.7 cm
Earth	0.8 cm
Mars	0.5 cm
Jupiter	2.0 cm
Saturn	1.7 cm
Uranus	1.1 cm
Neptune	1.0 cm

Note: These measurements are not to scale.

- Form clay balls that are approximately the same size as the circles that were drawn for the Sun and each planet.
- Color the clay balls to match the color of the Sun and each planet they represent.
- Color the plate to represent the Universe.
- Glue the clay balls in their correct spots on the plate.

PLANETARY POSSE

Molding Clay Recipes

Recipe 1:

- Mix together
- 2 1/2 cups flour
- 1 cup water
- 1 cup salt
- Food coloring, optional

Store in refrigerator.

Recipe 2:

Mix and cook over low heat until mixture thickens:

- 1 cup salt
- 1 cup water
- 1 cup flour
- Food coloring, optional

Cool before using.

Recipe 3:

Combine over low heat, stirring constantly until mixture becomes stiff and comes away from sides of pot:

- 1 cup salt
- 2 cups flour
- 2 cups water
- 4 tablespoons oil
- 4 tablespoons cream of tartar
- Food coloring

Store in a closed container or plastic bag.

Recipe 4:

Mix:

- 1 cup cornstarch
- 1 1/2cups cold water
- 2 cups bicarbonate of soda
- Food coloring

Heat over medium fire, stirring constantly until mixture is dough-like. Cool, covered with a damp cloth. Coat finished with a shellac to seal and preserve.

PLANETARY POSSE

FITNESS ACTIVITY

Juggling Planets

Whatcha Need:

Mission Time: 15-30 minutes
Small balls (foam, tennis), enough for one per player

Whatcha Do:

MISSION:

Learn and practice listing the order of the planets from memory, while exercising hand-eye coordination and pattern recognition.

PROCEDURE:

- Groups of 5-7 players stand in a circle.
- Establish a pattern starting with one ball and have the players toss the ball to each other using soft underhand passes.
    - No passing to the person next to you.
    - No one receives a pass twice until everyone has had the ball once.
- Once the group has the pattern, as they pass the ball, the whole group calls out the Sun and then Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and finally Pluto.
- When the group can successfully pass the ball through the pattern while calling out the Sun and planets in order, add a second ball. Then a third, fourth, fifth, etc.

PLANETARY POSSE

LIFE SKILLS ACTIVITY

Sun Spots: I Bet You Never...

Whatcha Need:

Mission Time: 30 minutes

Solar System Spots (dots, pieces of paper, chairs, or tape). You will need one less spot marker than total number of participants.

Whatcha Do:

MISSION:

Share the things we have in common and celebrate our diversity.

PROCEDURE:

- Arrange spots in a large circle representing the solar system.
- One player starts in the middle, representing the Sun. Everyone else is on a spot.
- The person in the middle states "I bet you never..." and finishes the sentence with something they have experienced and think others might have too. (climbed a tree, got bit by a dog, broke a bone...)
- Whoever has experienced the same thing must move from their spot and relocate to another newly empty spot. This includes the Sun in the middle of the group.
- Whoever is left without a spot becomes the Sun in the next round.

VARIATION:

- After each round, remove a spot. This will leave more than one person in the middle, a kind of nebula. The nebula in the middle must find something they have all done and share it. Each time a spot is removed a new nebula will form!

ORBITAL MECHANICS -GRAVITY-

ACADEMIC ACTIVITY

Mission Control Logs

Whatcha Need:

Mission Time: 30 minutes
Mission Control Log Handout, notebook paper, pencil or pen.
Your Best Robot Voice!

Whatcha Do:

MISSION:

Develop and use the vocabulary related to orbital mechanics and gravity.

PROCEDURE:

- Individually, in pairs, or small groups, use the Mission Control Log Handout to fill in the blanks with words that are grammatically correct and would complete the sentence.
- Take turns reading the completed Mission Control Log using a robot/electronically synthesized voice.
- Laugh!

VARIATIONS:

- Watch or listen to *Orbital Mechanics / Gravity* and create a Mission Control Log by using the vocabulary from the lyrics of the song.
- Create a Mission Control Log based on other solar system information.

ORBITAL MECHANICS
-GRAVITY-

Mission Control Log Handout

Mission Control, this is _____ contacting you from
FAMOUS PERSON

our space capsule. Our blast off was _____ . We reached
ADJECTIVE

a propulsion speed of _____ miles per _____, and are
NUMBER UNIT OF TIME

now orbiting around _____. It is _____
PLANET ADJECTIVE

here and we were amazed to see that this _____ rotates much
NOUN

more _____ than Earth. The gravitational pull is _____
ADVERB ADJECTIVE

and we're having a hard time _____. Our days are very
VERB ENDING IN "-ING"

_____ because it takes _____ hours to
ADJECTIVE NUMBER

revolve around the _____. If our trajectory is correct,
NOUN

we will be returning to _____ in _____
PLACE NUMBER

_____. Please tell our _____ that we miss
UNIT OF TIME PLURAL NOUN

them and will _____ them soon. Once we are back on Earth, the
VERB

first thing we will do is _____ our _____ and
VERB PLURAL NOUN

then say "_____!"
EXCLAMATION

ORBITAL MECHANICS
-GRAVITY-

Mission Control Log Handout

BASIC WORD USAGE

Noun- A word that represents a person, place, thing, or idea.

Adjective- A word that describes a noun.

Verb- A word that expresses action (i.e.: jump, run, drink) or a state of being (i.e.: was, were, are, etc.).

Adverb- A word that describes a verb, usually ending in "-ly."

Exclamation- A word that represents a sound, outcry, gasp, emotion, etc.

DIRECTIONS:

- Fill in the blanks with words of your choice or those from your friends.
- Read the Mission Control Log out loud.
- Laugh with your friends.

CREATE YOUR OWN LOGS!

- Write your own log to Mission Control.
- Remove some of the words and replace with a blank.
- Under each blank, write the type of word that goes needs to be replaced.

ORBITAL MECHANICS
-GRAVITY-

ARTS ACTIVITY

Space Shapes

Whatcha Need:

Mission Time: 30 minutes

Space Shapes Handout, rulers, compasses, protractors, plain white paper, crayons or colored pencils, pencil and eraser

Whatcha Do:

MISSION:

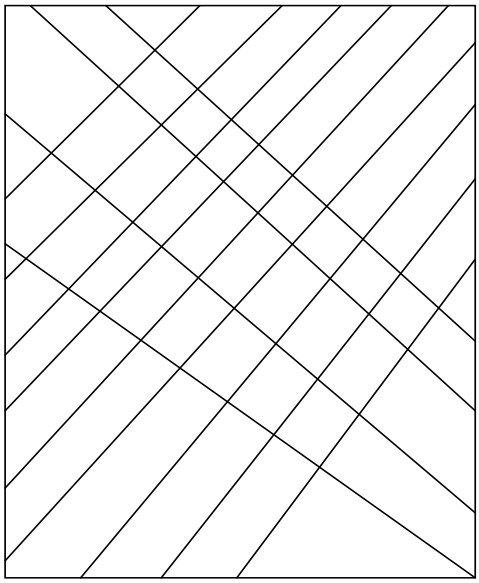
Create an original art piece that utilizes geometric shapes to represent objects found in space.

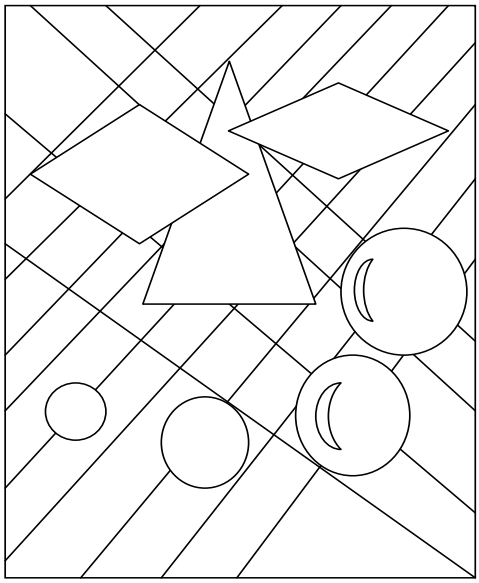
PROCEDURE:

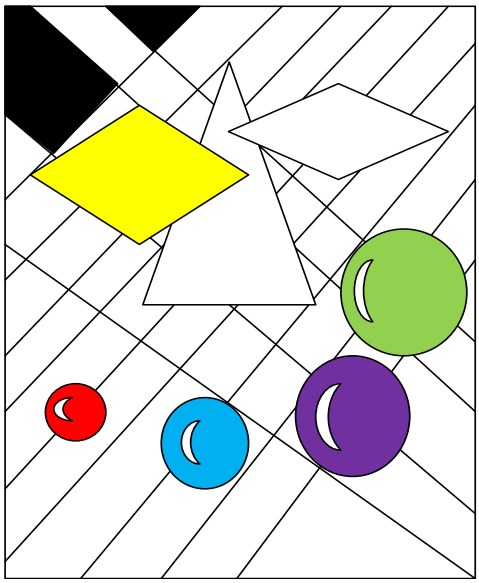
- Using various measurement tools (rulers, compasses, and traceable objects) create a design on plain white paper. Shapes can overlap and lines can extend across the page.
- Remove some of the lines to create depth and dimension, using an eraser.
- Color in sections of each shape.

ORBITAL MECHANICS
-GRAVITY-

Space Shapes Handout



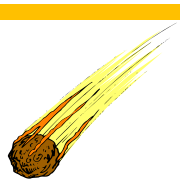




Directions:

Use ruler, compass, protractor, etc. to draw shapes. Erase lines so that some shapes overlap others. Color patterns to complete the design.

ORBITAL MECHANICS
-GRAVITY-



FITNESS ACTIVITY

Move It!

Whatcha Need:

Mission Time: 10-20 minutes
Large dedicated play area (the Universe), and list of commands for students to follow. Music can be used to cue movements, especially the *Orbital Mechanics/Gravity* song.

Whatcha Do:

MISSION:
Understand orbital mechanics by replicating the motions found in the Universe.

PROCEDURE:

- Learn the following actions based on the vocabulary from the *Orbital Mechanics/Gravity* song.
  - ***Gravity:*** everyone falls to the floor
  - ***Rotation:*** everyone spins around
  - ***Revolution***: find a partner and orbit around each other, like a "do-si-do"
  - ***Magnetize:*** everyone runs to the Sun and forms a giant clump
  - ***Propulsion:*** everyone jumps in the air
  - ***Trajectory:*** everyone does a diagonal leap towards a corner
- Choose someone to be the Sun, who calls out the commands.
- Whoever doesn't follow the command correctly or is the last to follow the command, gets sucked into a black hole and must run a lap around the Universe. After one lap, they can then return to the game.
- After several rounds, choose a new Sun.
- Make up new actions based on Space oriented vocabulary.

ORBITAL MECHANICS
-GRAVITY-

LIFE SKILLS ACTIVITY

Gravitational Pull

Whatcha Need:

Mission Time: 30 minutes
Gravitational Pull Handout, strong tug-o-war rope, tape, ribbon

Whatcha Do:

MISSION:

Understand how peer pressure can influence us.

PROCEDURE:

- Divide into two groups to play tug-o-war.
- For each round, one or more players will take different actions that will create various outcomes of the tug-o-war game. (See directions on handout.)
- Discussion questions help identify how the actions of others affected us and how that relates to the pressure placed on us by our peers.

VARIATIONS:

- Create alternate ways to affect the tug-o-war game.
- Design a new game or use an existing one to help explain the effects of peer pressure.

ORBITAL MECHANICS
-GRAVITY-

Gravitational Pull Handout

DIRECTIONS:

- Before each round begins one or more players will secretly be given the following instructions:
  - Player on one team is told that as soon as the game begins, he/she is to run to the other team.
  - One player is told to just stand and hold the rope, but not pull on it.
  - One or more players are told that once the game begins, to walk away and watch from the sidelines.
  - One or more players are told to go to the other side and bring back members of that team to add to his/her team.
  - One player stands to the side at the beginning of the round and then joins the team of his/her choice.
- Players act out their assigned roles, one assignment per round.
- At the end of each round, discuss how the players' behavior affected the outcome of that round.
- Relate the actions of the players in the game to the choices that our friends make and how they can influence the outcomes in our lives.
- For example: friends who desert to other side, friends that are near but don't help, friends who don't want to be involved, friends who stand beside and support us...

DISCUSSION QUESTIONS:

- How do the actions of one person affect the whole group?
- How did the group respond to that individual?
- How does this game resemble the power of peer pressure?
- How can friends affect our decisions or actions, positively or negatively?

MOONDANCE

ACADEMIC ACTIVITY

Moon Madness

Whatcha Need:

Mission Time: 30 minutes
Moon Madness Word Search Handout, Moon Madness Word List, pen or pencil

Whatcha Do:

MISSION:

Learn the different names, facts, and characteristics of moons in our solar system.

PROCEDURE:

- Using the lyrics of the *MoonDance* song and/or Moon Madness Word List, brainstorm the different names, facts, and characteristics of moons.
- Choose 15-20 of these words and make a list.
- Create a Word Search by placing the words in the grid on the handout or graph paper.
- Words can be placed so that they can be read up, down, left, right, diagonally, forwards, backwards, or even intersecting with other words.
- After all the words are on the grid, miscellaneous letters are used to fill in the remaining squares until the grid is completed.
- Exchange your Word Search and list with others and try to solve each others' puzzles.

MOONDANCE

Moon Madness Word Search

MOONDANCE

Moon Madness Word List

DIRECTIONS:

Use these words in your Word-Search puzzle. If you don't know the meaning to a word or a moon's name, please look it up in a dictionary, encyclopedia or on the internet!

AIR
APOLLO
ATMOSPHERE
CRATER
DIAMETER
DUST
EARTH
FACE
FOOTPRINTS
GALAXY
GRAVITY
ICE
JUPITER
LUNAR
LUNATICS
MARS
MOON
MOONQUAKE
MOONWALK
MOUNTAIN
NEIL ARMSTRONG
NEPTUNE
ORBIT
OVAL
PLUTO
ROCK
ROUND
SATELLITE
SATURN
SKY
SPACE
SOLAR SYSTEM
SOUND
STONE
UNIQUE
UNIVERSE
URANUS
WIND
TIDES

MOONDANCE

Moon Madness Word List

DIRECTIONS:

To make it even more challenging, try these moons' names!

Mars' Moons:
DEIMOS
PHOBOS

Jupiter's Moons:
ADRASTEA
AITNE
AMALTHEA
AUTONOE
CALLIRRHOE
CALLISTO
CARME
CHALDENE
ELARA
ERINOME
EUANTHE
EUPORIE
EUROPA
EURYDOME
GANYMEDE
HARPALYKE
HERMIPPE
HIMALIA
IO
IOCASTE
ISONOE
KALE
KALYKE
LEDA
LYSITHEA
MEGACLITE
METIS
ORTHOSIE
PASIPHAE
PASITHEE
PRAXIDIKE
SINOPE
SPONDE
TAYGETE
THEBE
THEMISTO
THYONE

Saturn's Moons:
ALBIORIX
ATLAS
CALUPSO
DIONE
ENCELADUS
EPIMETHEUS
ERRIAPO
HELENE
HYPERION
IAPETUS
IJIRAQ
JANUS
KIVIUQ
MIMAS
MUNDIILFARI
PAALIAQ
PAN
PANDORA
PROMETHEUS
RHEA
SIARNAQ
SKADI
SUTTUNG
TARVOS
TELESTO
TETHYS
TITAN
THRYM
YMIR

Uranus' Moons
ARIEL
BELINDA
BIANCA
CORDELIA
CRESSIDA
DESDEMONA
JULIET
MIRANDA
OBERON
OPHELIA
PORTIA
PROSPERO
PUCK
ROSALIND
SETEBOS
STEPHANO
SYCORAX
TITANIA
TRINCULO
UMRIEL

Neptune's Moons:
DESPINA
GALATEA
LARISSA
NAIAD
NERIAD
PROTEUS
THALASSA
TRITON

Pluto's Moons:
CHARON
HYDRA
NIX

MOONDANCE

ARTS ACTIVITY

Lunar Loyalty

Whatcha Need:

Mission Time: 30 minutes

Plain white paper or cardstock, scissors, glue, copies of pictures of friends and family, crayons or colored pencils, and markers. Optional: glitter, ribbon, puffy paint, etc.

Whatcha Do:

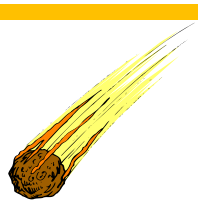
MISSION:

Understand the characteristics of loyalty and friendship. Create a collage that represents those characteristics.

PROCEDURE:

- Brainstorm the characteristics of what it means to be a loyal friend.
- Create a collage by cutting out and pasting photos of friends and family on construction paper or cardstock.
- Create titles, original drawings, etc. that describe or represent the characteristics from the brainstorm session.
- Be creative by decorating with glitter, markers, ribbons, etc.
- Share the finished piece with others and explain how your collage represents the qualities of loyalty in a good relationship.

MOONDANCE



FITNESS ACTIVITY

Moonwalk Relay Race

Whatcha Need:

Mission Time: 10-30 minutes
Two paper plates per team (inexpensive, thin ones work best) and two cones per team, smooth indoor surface, and the *MoonDance* song

Whatcha Do:

MISSION:
Work as a team to build coordination and moonwalk successfully.

PROCEDURE:
- Divide into teams of 5 – 6 players in each team. Have teams pick different moon names (Io, Europa, Calisto, etc.) from the Moon Madness Word List.
- Each team forms a single file line.
- Place a cone as a "moon marker" on the opposite side of the playing space.
- A player from each team will step on paper plates and "moonwalk" (glide backwards) down around the far cone and back to their teammates.
- Teammates encourage, give directions, and ensure the safety of the moonwalker.
- When they've reached their teammates, moonwalkers step off their plates, sit at the end of the line, and the next teammate moonwalks. The game continues until everyone has had a turn.

VARIATIONS:
- This game can be played in multiple rounds.

MOONDANCE

LIFE SKILLS ACTIVITY

Satellite Scramble

Whatcha Need:

Mission Time: 30-45 minutes
Blind folds, one for every two students. Safe designated area for trust walks, with various ways to stimulate the senses.

Whatcha Do:

MISSION:

Understand how important the quality of trust is in relationships.

PROCEDURE:

- Divide into pairs.
- One person in the pair is blindfolded and the other takes him/her on a trust walk, giving a safe and fun experience. Pairs are encouraged to do things that would use the other four senses: touch, taste, smell, and hearing.
- Switch roles half way through the activity.
- Discussion questions help identify how this experience affected the participants and how it relates to developing trust in their relationships.
- Sample questions might include:
  - What was easy about this activity?
  - What was hard about it?
  - What did you like best about it?
  - How does this activity help you learn to trust others?
  - How important is trust in friendships?
  - What are some ways to gain or lose trust in friendships?

METEOR-WRONG BLUES

ACADEMIC ACTIVITY

Rite or Wrong: Compare/Contrast

Whatcha Need:

Mission Time: 30-45 minutes
Rite or Wrong Venn Handout, notebook paper, and a pen or pencil. More information @ **http://dawn.jpl.nasa.gov/Meteorite/PDF/FAM_Leader_Guide.pdf**

Whatcha Do:

MISSION:

Graphically represent a comparison/contrast of the characteristics of meteors, meteorites, and meteoroids and verbally share that information with others.

PROCEDURE:

- Watch or listen to *Meteor-Wrong Blues* song or go to the website and list the characteristics of:
  - Meteor - Meteorites - Meteoroids
- Use those characteristics to create a fun saying, rhyme, or jingle on the Rite or Wrong Venn Handout. Be sure to place them in the proper section (characteristics shared individually, by two, or by all three of the objects.)
- Once the diagram is completed, choose one and present it to the rest of the group, giving factual information based on the characteristics from your diagram.

VARIATIONS:

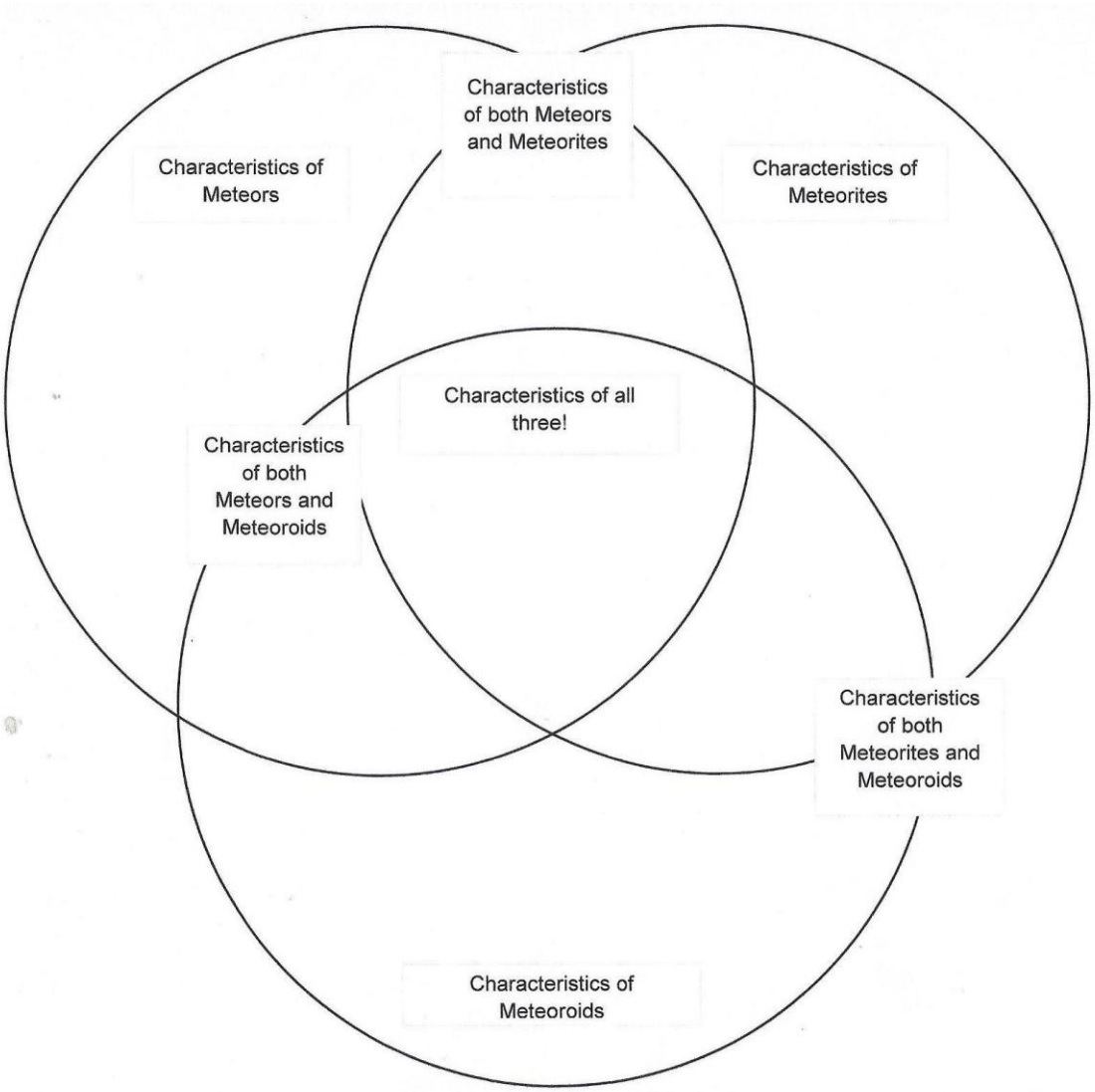
- You can do a simple compare/contrast with just two of the objects.
- You can illustrate/animate the characteristics instead of writing them out.
- Form groups and have a debate about which of the three has the most interesting characteristics.

METEOR-WRONG BLUES

Rite or Wrong Venn Handout

DIRECTIONS:

Use this graphic organizer to identify and compare / contrast the characteristics of meteors, meteorites, and meteoroids.



METEOR-WRONG BLUES

ARTS ACTIVITY

A Day in the Life of a Meteor-Wrong

Whatcha Need:

Mission Time: 45-60 minutes
A Day in the Life of a Meteor-Wrong Sample Skits handout, plain white paper, pen or pencil, and your best acting skills.

Whatcha Do:

MISSION:
Write and perform a skit that portrays a day in the life of Meteor-Wrong with the help of the sample skits provided or create an original piece.

PROCEDURE:
- Create a storyline and a list of characters.
- Create dialogue to present the storyline using all of the characters.
- Cast each character.
- Practice skit.
- Perform the skit for your fellow thespians.

METEOR-WRONG BLUES

A Day in the Life of a Meteor-Wrong Sample Skits

DIRECTIONS:

Here are some ideas to get you started on a storyline. You can write dialogue for these and/or create your own!

IDEA # 1:

It's "THE GALAXY GAME SHOW" sponsored by Milky Way. The excited contestants stand behind their podiums, ready to answer the questions and win big prizes. Hosted by the very loud, super-smiley, way-too-happy **Astronaut Al** (or **Alice**), the contestants are: **Sally Star**, a famous actress who wears fashionable sunglasses and a glittering gown; **Big the Dipper**, a rootin' tootin' cowboy who's a long way from home on the range; and **Meteor-Rite**, a wild fireball who every time he/she answers the question, it's always WRONG!

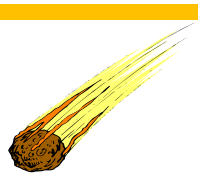
IDEA # 2:

Mike (or **Michelle**) appears to be a regular meteor, but he/she is really a super-hero named **Super-M** who wants to save the solar system from utter peril. The only problem is that Super-M is no good at it. Whenever Super-M tries to help the planets, moons, asteroids, comets, or stars in distress he/she just makes it worse!

IDEA # 3:

We're on the movie set of "Around the Universe in 80 Days" and the Academy Award winner, **Steven** (or **Stephanie**) **Meteor-berg** is the director. With a cast of the biggest stars in the business, Meteor-berg is having a ton of trouble communicating to them. Every time he/she gives the actors direction, they don't listen and do the opposite!

METEOR-WRONG BLUES



FITNESS ACTIVITY

Rite or Roid?

Whatcha Need:

Mission Time: 30 minutes
Two teams, open playing space, and two *Safe Areas* at opposite ends of the room.

Whatcha Do:

MISSION:
Use logic and quick thinking to outsmart your opponent and win the match for your team.

PROCEDURE:

- Both teams line up in their *Safe Area*, facing the middle of the room.
- When the teams are ready, someone yells "Rite or Roid, 1, 2, 3." Both teams race to the middle of the playing space and line up directly in front of a player of the opposing team.
- Each player throws their sign (like rock, paper, scissors.)
    - Practice these signs prior to playing the game.
        - **Meteoroid** – hands over head
        - **Meteor** – arms around self
        - **Meteorite** – smash fist in hand
            - ***Meteoroid*** *beats* ***Meteor*** *because it's not stuck in Earth's atmosphere.*
            - ***Meteor*** *beats* ***Meteorite*** *because it's too hot to handle.*
            - ***Meteorite*** *beats* ***Meteoroid*** *because the journey has come to an explosive end.*
- If a player loses, they squat down. If they win, they remain standing. For each round, the team with the most players standing wins!
- After each round, teams race back to their *Safe Areas* and start again.
- The team that wins the most rounds, wins the game!

METEOR-WRONG BLUES

LIFE SKILLS ACTIVITY

Me and My World

Whatcha Need:

Mission Time: 45-60 minutes
Creating a Vision Handout and Vision Board Sample, magazines, newspapers, photos, glue, scissors, and other decorative items.

Whatcha Do:

MISSION:
Understand the importance of setting goals and how that influences our success.

PROCEDURE:

- Use the answers from the Creating a Vision Handout to help explore what your vision for your life may be.
- Cut out pictures from magazines that symbolize things you want to create, emanate, become, and/or have in your life. This could be words, role models and heroes, pictures, goals, etc…
- Glue the cut-outs onto a poster board.
- Decorate with empowering words, quotes, glitter, drawings.
- Hang your vision board up in the classroom or take it home so you can reflect on your goals with your family, friends, or by yourself.

METEOR-WRONG BLUES

Creating a Vision Handout

DIRECTIONS:

Read and answer each of the questions to help explore what your vision for your life may be.

Who are your top 3 heroes, living or not?

1. _____
2. _____
3. _____

Why are these people your heroes? What special accomplishment have they done? What obstacles have they overcome? What are their characteristics that you admire?

_____
_____
_____
_____

If you could do or be anything in the world, what would you do? Why?

_____
_____
_____

Where do you see yourself in the future?

1 Year? _____

5 Years? _____

10 Years? _____

50 Years? _____

METEOR-WRONG BLUES

Vision Board Sample

STAND-UP COMET

ACADEMIC ACTIVITY

Comet Strip

Whatcha Need:

Mission Time: 30-45 minutes
Comet Strip Handout and Comet Strip Layout, crayons, markers or colored pencils, pen or pencil, sample comic strips from the newspaper.
More information @ **http://solarsystem.nasa.gov/deepimpact/index.cfm**

Whatcha Do:

MISSION:
Tell a story by writing dialogue and creating a visual representation of it in the form of a comic strip.

PROCEDURE:

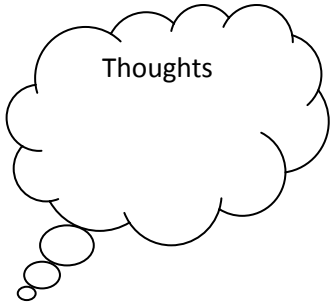
- Look at examples from the newspaper to see how comic strips are made.
- Notice the different types of communication bubbles: speech, thought, exclamation, etc.
- Watch the *Stand-up Comet* routine, then create storylines that are based on the jokes told in it.
- Brainstorm comet characteristics. Include information about nucleus, coma, tail, orbit, composition (ice, dust, rock, etc.)
- Write a dialogue that tells the story.
- Illustrate the dialogue with pictures.

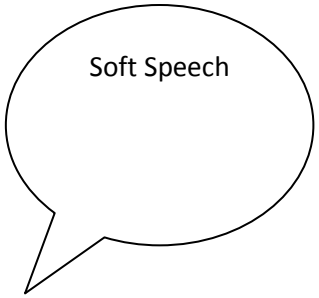
STAND-UP COMET

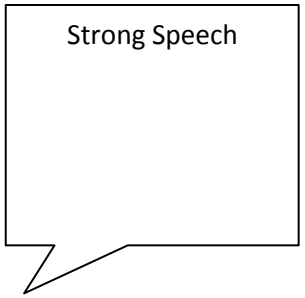
Comet Strip Handout

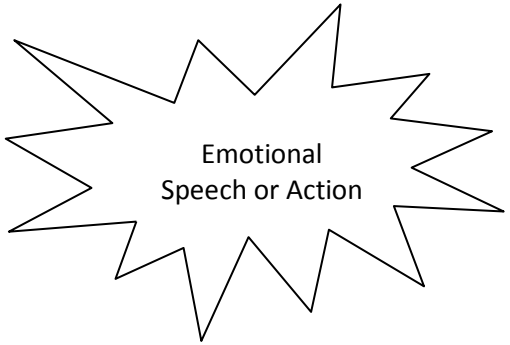
DIRECTIONS:

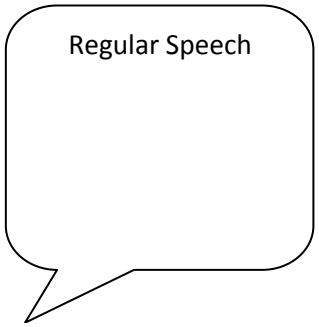
- Create a story line based on the characteristics of comets and one of the Stand-Up Comet's jokes.
- Create dialogue used to tell the story.
- Place dialogue in speech bubbles so the story is told from left to right and top to bottom of the layout form.
- Illustrate the story according to the speech bubbles in each box in the layout.

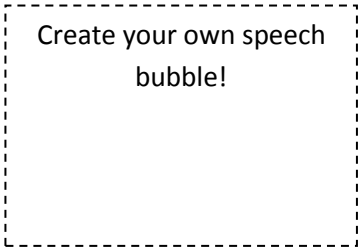












STAND-UP COMET

Comet Strip Layout

STAND-UP COMET

ARTS ACTIVITY

What's Up With Your Face?

Whatcha Need:

Mission Time: 30 minutes
Emotion Charades Handout, index cards, markers or crayons.

Whatcha Do:

MISSION:
Learn to identify and recognize emotions in ourselves and others.

PROCEDURE:
- Brainstorm various emotions.
- Create emotion cards with an expression face and name of the emotion on the index cards.
- Practice the different emotion expressions in front of a mirror or with a partner.
- Place all emotion cards in a container.
- Take turns picking a card and acting out that emotion using only gestures and facial expressions. No words or sounds!
- Before anyone mimes the emotion on their card, the whole group calls out, "What's up with your face?"
- Everyone guesses which emotion is being portrayed.

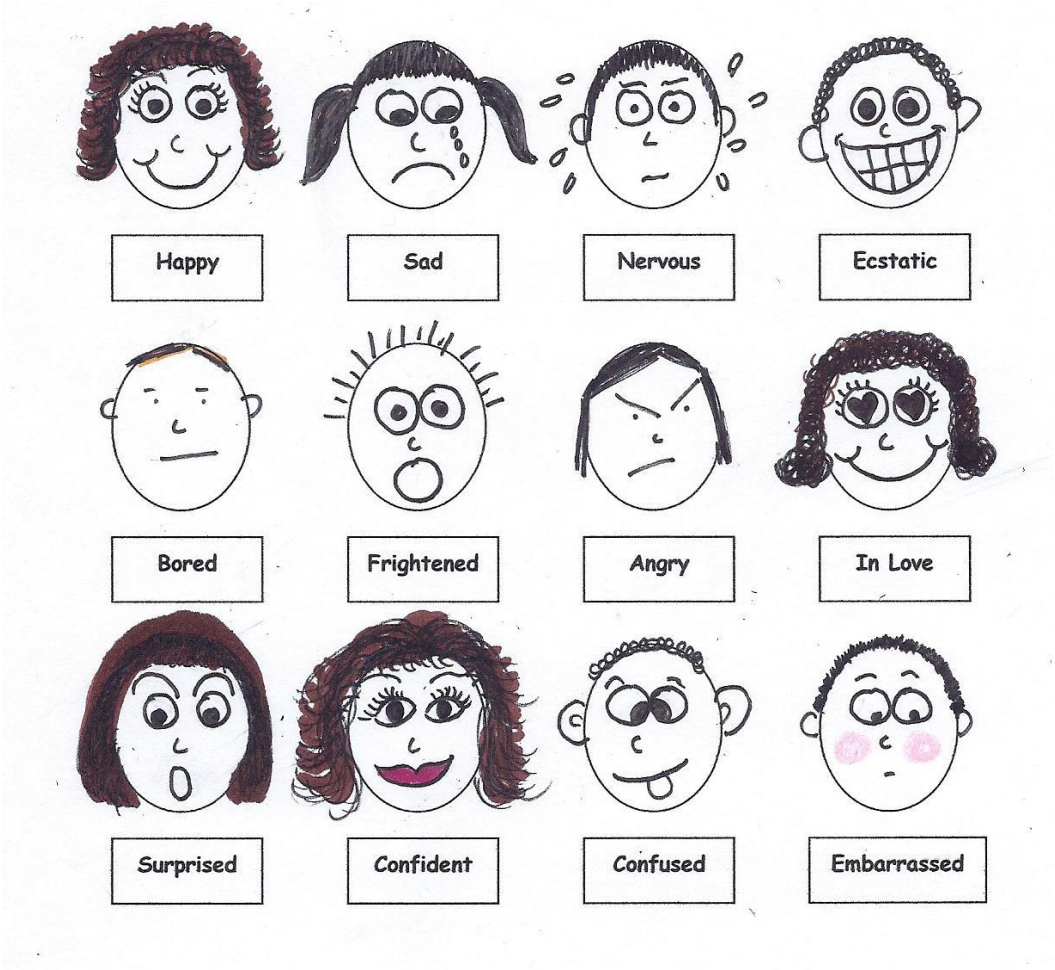
STAND-UP COMET

Emotion Charades Handout

DIRECTIONS:

- Using 3 x 5 cards, draw a face that represents the emotion and label it.
- Place cards in a container.
- Pick a card and act out the emotion using only gestures and facial expressions.

Some sample emotions and their expressions:



STAND-UP COMET

FITNESS ACTIVITY

Control That Comet!

Whatcha Need:

Mission Time: 15-20 minutes
8-10 playground balls.

Whatcha Do:

MISSION:
Develop hand-eye coordination, quick reflexes, and protect your atmosphere from wayward comets.

PROCEDURE:

- Form groups with 7 – 9 players in a small circle.
- Use your legs to create a "goal" by standing with your feet wide apart. The outsides of your feet should touch the feet of the person next to you. Remain in this position throughout the game.
- Start with one ball per group.
- The object of *Control that Comet!* is to score a goal by rolling or tossing the ball through the legs of anyone else in the circle.
    - Keep the ball **low**.
    - If the ball goes outside of the circle then the person who touched it last retrieves it. They toss the ball back in first and then rejoin the group.
- As you advance in skill, add a second or even a third ball.

VARIATIONS:

- Create the circle with the players facing outward instead of inward.
- Use blindfolds.
- Use different sized balls or use only one hand.

STAND-UP COMET

LIFE SKILLS ACTIVITY

I Got Your Back!

Whatcha Need:

Mission Time: 20-30 minutes
I Got Your Back Coping Skills Handout, index cards, tape or safety pins.

Whatcha Do:

MISSION:
Identify positive and negative ways to cope with difficult situations.

PROCEDURE:
- Create a list of common problems faced by you and your friends. Brainstorm both effective and ineffective ways to cope with these problems.
- Write a coping skill or a problem on a index card.
- Tape or safety pin the cards on each other's backs without showing what is on the card.
- Ask each other questions that can only be answered with a "yes" and "no" and try to determine what skill or problem has got your back.
- After everyone has guessed what is on their card, try to match the best coping skill for resolving each problem.

STAND-UP COMET

I Got Your Back Coping Skills Handout

DIRECTIONS:

- Create a list of common problems and ways to cope with them. Some examples are listed below.
- Write both the problems and the coping skills on index cards, one per card.
- Tape or pin a card to the back of each person without them seeing what is on the card.
- Walk around and only ask questions that can be answered by "yes" or "no."
- Guess what is on your back.
- After everyone has guessed what is on their back, match the problems with the best coping skills and discuss why that skill was chosen.

PROBLEMS	COPING SKILLS
- Teased someone	- Telephone a friend
- Bullied someone	- Tell a joke
- Made a mistake in front of class	- Write in a journal
- Told someone's secret	- Take a walk
- Did something embarrassing	- Tell my parent
- Got angry	- Listen to music
- Got feelings hurt	- Play with my friends
- Someone told your secret	- Take some time
- Cheated to win a game	- Play a game
- Lost/broke something you borrowed	- Help someone
- Someone lost/broke something of yours	- Draw or paint

THE ASTERIOD GANG

ACADEMIC ACTIVITY

Asteroids Rock

Whatcha Need:

Mission Time: 45-60 minutes

Asteroids Rock Probability Handout and Asteroid Belt Marble Game handout, pen or pencil, one small brown paper bag per pair or group, 3-5 different colored/kinds of marbles to represent asteroids - 10 of each color/kind. (Other objects can be substituted like cereal, M & M's, buttons, counting cubes, etc.)

Whatcha Do:

MISSION:

Gain an understanding of probability and ratio. Create a graph representing the observations and a chart to share that data.

PROCEDURE:

- Each pair or small group has a bag of marbles with 2 or 3 different colors/kinds in it.
- Before pulling a marble from the bag, predict what color/kind will be chosen. Then reach in and take out a marble. No peeking!
- After each turn, record the color/kind of marble in the table on the Asteroids Rock Probability Handout.
- After all the marbles have been removed from the bag and recorded, compare your results with other groups.
- Play a marble game from the Asteroid Belt Marble Game handout!

THE ASTERIOD GANG

Asteroids Rock Probability Handout

DIRECTIONS FOR SETTING UP THE BAG:

- Sort your marbles by color or kind.
- Place the same number of two different colors/kinds into the bag.
- Reach into the bag and pull out one marble.
- Record which color/kind of marble you picked on the handout.
- Place the marble back in the bag and repeat 10, 20, 50 times, taking turns with your pair/group and record each result.
- Now place the same number of three different colors/kinds of marbles in the bag.
- Repeat what you did for just two marbles, only this time with three different colors/kinds of marbles in the bag.
- Record the results on the handout.
- Answer the questions on the handout.

NOTE:

The number of colors/kinds of marbles tell you what chance you have of pulling them out of the bag, as long as there are the same number of marbles of each color/kind. With only two colors/kinds, you have a 50-50 chance of picking one of them. With three different colors/kinds, you have a 1 in 3 chance, or 1/3 chance of selecting them.

THE ASTERIOD GANG

Asteroids Rock Probability Handout

DIRECTIONS FOR RECORDING PROBABILITY:

Pick one marble from the bag with **TWO** colors/kinds inside and record a hash mark for each time you pull the color/kind. Total the number of times you drew that color/kind in the each set of trials.

Number of Trials	1st Color/Kind_____	2nd Color/Kind_____
10	𝍸 𝍸 ||| Total _____	Total _____
20	Total _____	Total _____
50	Total _____	Total _____

What did you notice when the number of trials increased?
What do you think would happen if you did 100 trials?
What if you did 500 or 1000?

Now repeat the trials with **THREE** different colors/kinds.

Number of Trials	1st Color/Kind_____	2nd Color/Kind_____	3rd Color/Kind_____
10	Total _____	Total _____	Total _____
20	Total _____	Total _____	Total _____
50	Total _____	Total _____	Total _____

THE ASTERIOD GANG

Asteroids Rock Probability Handout

DISCUSSION QUESTIONS:

- In what ways were these two sets of trials the same?
- How were they different?
- How does understanding probability and ratio help you with this activity?

TERMS:

- **Probability**- how likely it is that something will happen
- **Ratio**- the relationship between two amounts or kinds of things

DIFFERENT KINDS OF MARBLES:

Marbles have names based on their colors, patterns, or markings.

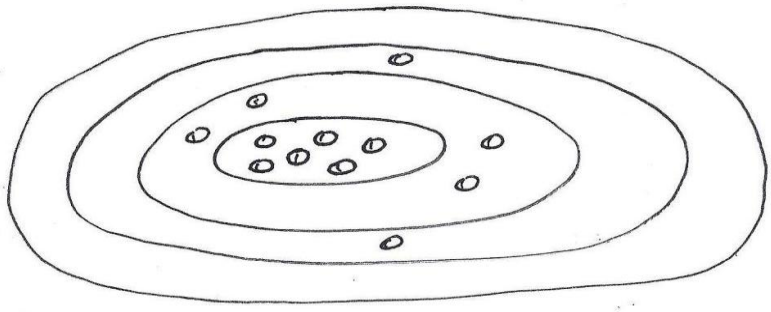
- **Aggies-** made of agate, usually marbled gray or black.
- **Alley-** looks like alabaster marble.
- **Cat's Eye-** clear with a twist of color inside.
- **Clearie-** clear, any color
- **Corkscrew-** glass marble with two or more spirals of color, on the outside
- **Milkie-** solid, white marble
- **Puree-** solid, colored marble
- **Steelie-** steel ball bearing, used as a marble.

THE ASTERIOD GANG

Asteroid Belt Marble Game

DIRECTIONS:

- Draw four circles, one inside the other, in the dirt or on the pavement. The first circle should be about 2 ft. in diameter, the second 4 ft., the third 6 ft., and the outside circle should be 8 ft.
- Each player places three marbles in the inner circle, two in the second circle, and one in the third circle. There are no marbles in the fourth circle when you start the game.
- Using a shooter marble, players take turns aiming at his/her marbles in the third circle. The goal is to bump the marbles from the outer circles into the inner circle.
- If a player hits a marble in the third circle, his/her turn continues from there.
- If he/she misses the shot, the player must return to shooting from the outer ring.
- The first player to move all his/her marbles to the inner circle wins.
- Players can choose to use their turn to try to knock their opponents marbles out of the center ring or move his/her marble into the center ring. As long as they hit a marble, they can keep playing.



THE ASTERIOD GANG

ARTS ACTIVITY

Asteroids in ACT-ion

Whatcha Need:

Mission Time: 45-60 minutes
Finger Puppet Handout, various materials to make finger puppets (paper, cloth, buttons, google eyes, felt, markers, crayons, pipe cleaners, etc.)

Whatcha Do:

MISSION:
Create and perform a finger puppet show.

PROCEDURE:
- Design and build various finger puppets that represent the Asteroid Gang.
- Create a storyline and dialogue for the puppet show.
- Cast each character.
- Practice the puppet show.
- Perform the skit for your fellow puppeteers.

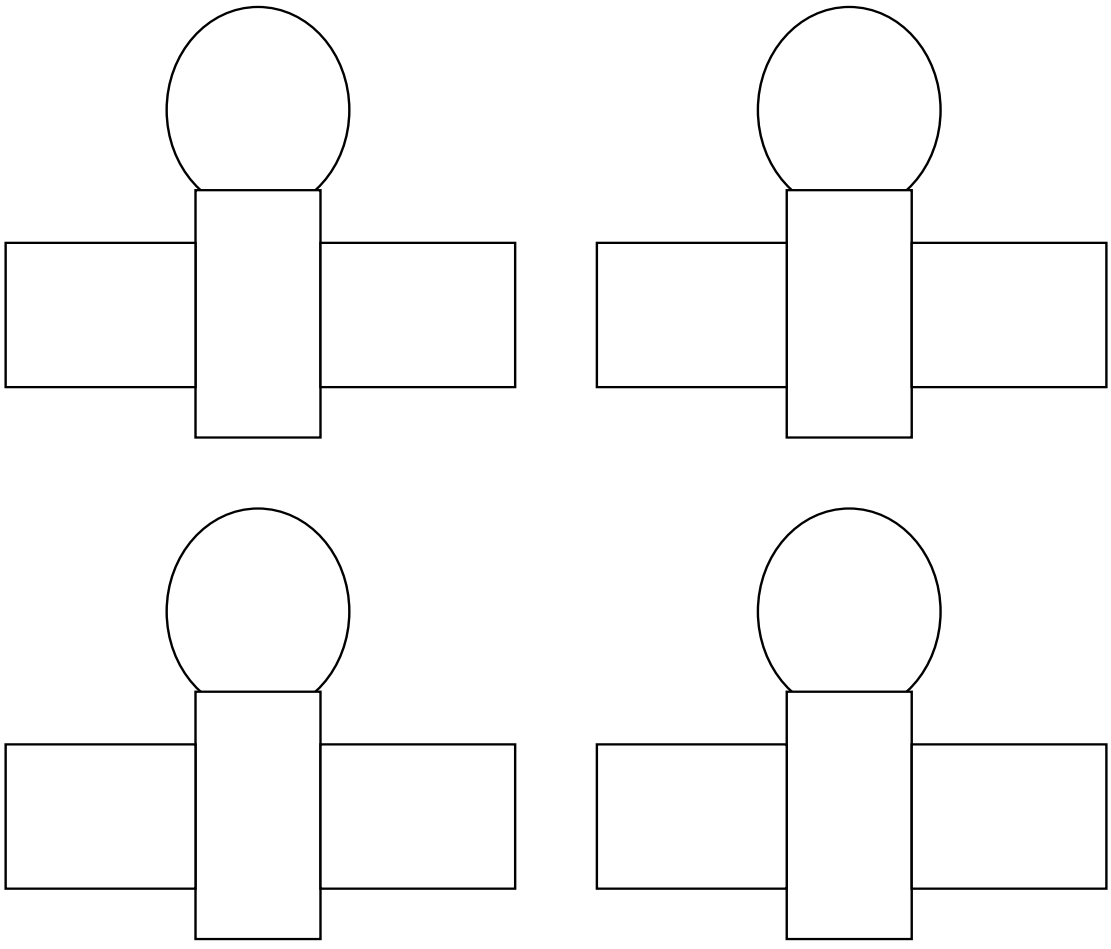
VARIATIONS:
- Design and construct a puppet show stage to use in performances.
  - Using a cardboard box, cut off its lid.
  - Cut a rectangle in the bottom, leaving enough of the bottom of the box to hide your hands.
  - Place the box on its side, so you can reach in from the back.
  - Add curtains and have some fun!

THE ASTERIOD GANG

Finger Puppet Handout

DIRECTIONS:

- Cut out the basic pattern for the finger puppets.
- Using various materials, create your puppets.
  - Make a head or face, add hair, eyes, ears, etc.
  - Decorate a body, clothing, belts, etc.
  - Add arms, legs, & accessories.
- Place finished puppet around your fingers and tape or clip into place.
- Entertain your friends and family!



THE ASTERIOD GANG

FITNESS ACTIVITY

Asteroid Belt

Whatcha Need:

Mission Time: 20-30 minutes
Dedicated play space, *Tagging Objects* (swimming noodle, foam ball, yarn ball, paper towel or wrapping paper tube, etc.) You will need 1 *Tagging Object* for every 3 students.

Whatcha Do:

MISSION:
Dodge flying asteroids while playing a tag game to stay fit.

PROCEDURE:
- Distribute the *Tagging Objects*.
- Those who have *Tagging Objects* are the TAGGERS.
- Everyone else tries to avoid being tagged.
- Tagging results in the following:
    - If a player is tagged and they have a *Tagging Object* they need to LAUNCH it.
        - Launching means: throwing the *Tagging Object* in the air.
    - If person tagged has no *Tagging Object*, he/she becomes a ROVER.
        - ROVERS assume ROVER POSITION (squatting or crab-walking while they're moving about.)
        - ROVERS cannot be tagged.
- Only a ROVER can pick up a *Tagging Object* and then become a TAGGER.

THE ASTERIOD GANG

LIFE SKILLS ACTIVITY

Angry Asteroids

Whatcha Need:

Mission Time: 30 minutes
Angry Asteroids Maze Handout, graph paper, pen or pencil.

Whatcha Do:

MISSION:

Identify things that cause anger and find the best ways to navigate through difficult situations.

PROCEDURE:

- Brainstorm things that can sometimes get you angry.
- List the ways to deal with that anger, considering both positive and negative ones.
- Using the Angry Asteroids Maze Handout, draw a maze that starts with anger and ends with a positive way of dealing with it.
- Create a maze.
  - Start by drawing the outside walls.
  - Create only one right path, with several others that result in dead ends.
- Solve each other's mazes.

THE ASTERIOD GANG

Angry Asteroids Maze Handout

WE'RE THE SCIENTISTS

ACADEMIC ACTIVITY

Scientifically Speaking - Crossword Connection

Whatcha Need:

Mission Time: 30-45 minutes

Scientifically Speaking - Crossword Connection handout, Scientific Methods Word List, graph paper, sample crossword puzzles, pencil or pen.

Whatcha Do:

MISSION:

Develop scientific vocabulary and link major discoveries with noted scientists by creating a crossword puzzle.

PROCEDURE:

- Create a list scientific terms and scientists along with their major contributions, using the lyrics of the *We're the Scientists* song.
- Use graph paper to create a crossword puzzle with words that come from either the scientist's name, contribution, or scientific terms. Words are arranged in the puzzle so that one or more letters are connected, overlap, and intersect.
- Number the first letter of each word and write a clue that will help others guess the word.
- After the crossword is designed, on another piece of graph paper, replicate the puzzle using empty boxes in place of the letters for each word.
- Solve each others' puzzles.

WE'RE THE SCIENTISTS

Scientifically Speaking - Crossword Connection

WE'RE THE SCIENTISTS

Scientific Methods Word List

DIRECTIONS:

Use any of these words to create your scientific crossword puzzle or find your own! Be sure to look these words and/or people up so you have an accurate definition for your crossword clue.

ALBERT EINSTEIN
APPLE
ASTRONAUT
ATMOSPHERE
BENJAMIN FRANKIN
BIOLOGY
BIOSPHERE
BLACK HOLE
CHEMISTRY
COPERNICUS
CRYOSPHERE
CURIOUS
DISCOVERY
ELECTRICITY
ENGINEERING
EXPERIMENT
EVOLUTION
FAIL
FIBONACCI
GALILEO
GODDARD
GRAVITY
HALLEY
HELIUM
HERSCHEL
HUBBLE
HUYGENS
HYDROSPHERE
HYDROGEN
KEPLER
KITE
KNOWLEDGE
LAB
LAW
LOUIS PASTEUR
MAGNET
MARIE CURIE
MATHEMATICS
METHANE
NEWTON
NOBEL PRIZE
OXYGEN
PHYSICS
PROVE
QUAGMIRE
QUESTIONS
RADIOACTIVE
RELATIVITY
SCIENTIFIC
METHOD
SCIENTIST
SEQUENCE
SPACE
STEPHEN HAWKING
STAR
SUM
SUN
TECHNOLOGY
TELESCOPE
TENACITY
THEORY
THOMAS EDISON

WE'RE THE SCIENTISTS

ARTS ACTIVITY

A Scientist in the Making!

Whatcha Need:

Mission Time: 30 minutes
Silhouette Art Handout, black and white paper, scissors, colored pencils, and glue.

Whatcha Do:

MISSION:

Create silhouette art representing yourself as an imaginary scientist communicating an amazing contribution you would like to make to the world.

PROCEDURE:

- Imagine yourself as a scientist. Brainstorm your characteristics and create a brief autobiographical sketch.
- Now consider what discoveries or contributions you would like to make for the world. What are you curious about? What does the world need but has not been discovered or invented yet?
- With a friend, create a silhouette portrait using your profile as the basis of the scientist you would like to be.
- Be creative by adding fun features and something that represents your scientific contribution.

WE'RE THE SCIENTISTS

Silhouette Art Handout

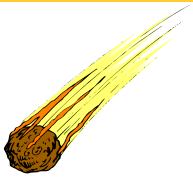
DIRECTIONS:

- Tape a piece of paper to a wall.
- Have a friend sit close to the wall, near the paper.
- Use a light to cast the shadow of your friend's profile on the paper and trace it directly onto the paper.
- Cut the profile out and place it on a contrasting piece of colored paper.
- Add additional features on the colored paper to represent your scientific discovery.

ALTERNATIVE METHOD:

- Take a digital photo of your own profile or that of a friend.
- Trace the profile on tracing paper.
- Staple or tape the tracing paper on colored construction paper.
- Cut out the silhouette and paste it on a background that represents your scientific discovery.

WE'RE THE SCIENTISTS



FITNESS ACTIVITY

A Scientific Journey

Whatcha Need:

Mission Time: 15-20 minutes
Large dedicated play space, index cards.

Whatcha Do:

MISSION:
Engage in a circuit training physical activity that represents the step-by-step process of the scientific method.

PROCEDURE:

- Create a station activity card for each of the following steps of the Scientific Process:
  - **HYPOTHESIS:** Partner push, wall squat, thinker position
  - **MATERIALS:** Run in place, about face, jumping jacks
  - **PROCEDURE:** Grapevine, with a spin, or advanced squat thrust
  - **CONCLUSION:** Downward Dog, reach up for sky
  - **STATEMENT:** Push up, high-five with a partner
- Place the station activity cards in 5 different locations in the play space.
- In circuit training style, partners rotate from station to station in 1 minute intervals following the instructions on the cards, while imagining they are scientists making a discovery.

WE'RE THE SCIENTISTS

LIFE SKILLS ACTIVITY

The Path of Discovery

Whatcha Need:

Mission Time: 30 minutes
Path of Discovery Handout, paper, dots, or tape to mark a 5' x 5' grid on the floor, a noise maker (horn, whistle, etc.)

Whatcha Do:

MISSION:
Take risks, learn from your mistakes, and trust yourself.

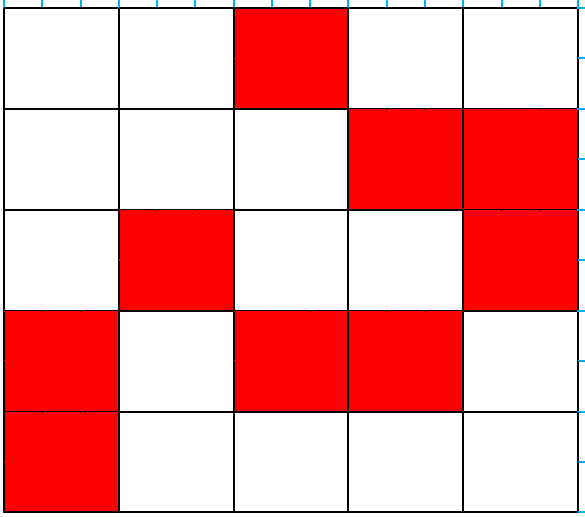
PROCEDURE:
- A 5' x 5' grid is made on the floor using paper, dots, chalk, or tape.
- Using the Path of Discovery Handout, everyone creates a path through the 5' x 5' grid. One of the grids is chosen and its creator assumes the role of the Professor and everyone else is a Research Team Member.
- By trial and error, each Research Team Member will take a turn on the grid trying to guess the correct direction of the Path of Discovery, making sure to step in spaces adjacent to the last step.
- A step can't be repeated twice.
- The Professor will use the noise maker to indicate if the Research Team Member has made a wrong step. If it is the correct step along the path, the Research Team Member on the grid will hear no sound.
- If a Research Team Member makes a wrong step, he/she must exit the path the same way he/she came in. Then it is the next person's turn.
- It is important for all Team Members to pay attention so they can build on the success of those who went before them.
- Once the path is solved, another grid can be chosen.

WE'RE THE SCIENTISTS

Path of Discovery Handout

DIRECTIONS:
Use the graph paper below to design your own path of discovery!

SAMPLE GRID



BIG BANG

ACADEMIC ACTIVITY

Crack the Code

Whatcha Need:

Mission Time: 45 minutes
Crack the Code Handout, paper, pen, or pencil.

Whatcha Do:

MISSION:

Sharpen your deciphering skills through the science of cryptography, a method of secret writing.

PROCEDURE:

- Brainstorm a scientific word, phrase, or sentence.
- Using the Crack the Code Handout key, create a secret message based on your brainstorm.
- See if your friends can decode your message.
- Make up your own code.
- Share a message using your secret code with others so they can try to crack it.

BIG BANG

Crack the Code Handout

CODES ARE COOL!

Codes have been utilized throughout history to make things easier to use, to help keep things a secret, and to help clarify the unknown.

The Rosetta Stone, discovered by Napoleon's Army in 1799, had the same messages in three languages, Greek, demotic, and hieroglyphs. It provided the key to deciphering the Egyptian hieroglyphs and even today, the term Rosetta Stone is used to describe anything that unlocks a mystery.

Here are some other examples of codes:

Binary Code- used to program computers.

http://www.tekmom.com/buzzwords/binaryalphabet.html

Genetic Code- used to determine your genetic traits.

http://www.uga.edu/srel/kidsdoscience/kidsdoscience-genetics.htm

http://www.uga.edu/srel/kidsdoscience/genetics/genetics-poster-1.pdf

Morse Code- used to send telegraphic messages.

http://earthrenewal.org/morse.htm

Morse code key

Letters		Numbers	
A	•—	1	•—————
B	—•••	2	••———
C	—•—•	3	•••——
D	—••	4	••••—
E	•	5	•••••
F	••—•	6	—••••
G	——•	7	——•••
H	••••	8	———••
I	••	9	————•
J	•———	0	—————
K	—•—		
L	•—••		
M	——		
N	—•		
O	———		
P	•——•		
Q	——•—		
R	•—•		
S	•••		
T	—		
U	••—		
V	•••—		
W	•——		
X	—••—		
Y	—•——		
Z	——••		

BIG BANG

Crack the Code Handout

DIRECTIONS:

Use the sample codes below to decipher the following sentences.

1. 23 8 5 14 20 8 5 19 21 14 8 9 20 19 1 4 18 21 13 9 20 13 1 11 5 19 1 2 9 7 2 1 14 7!

2. Gur cynargf trg qbja nf gurl qnapr nebhaq.

SAMPLE CODES:

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
14	15	16	17	18	19	20	21	22	23	24	25	26
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Answers:

1. When the Sun hits a drum it makes a big bang!

2. The planets get down as they dance around.

BIG BANG

ARTS ACTIVITY

Synergistic Solar System

Whatcha Need:

Mission Time: 30 minutes

Small boxes, construction paper, glue, scissors and any other materials to use in creating a diorama (pipe cleaners, cotton balls, etc.)

Whatcha Do:

MISSION:

Create a diorama that represents all of the planets and objects that are found in our Universe.

PROCEDURE:

- Brainstorm all of the objects and celestial bodies, along with their basic characteristics in our solar system.
- Dioramas should include: Sun, planets, meteoroids, comets, etc.
- Create 3-dimensional shapes that represent objects in our Universe using any of the provided materials.
- Cut off the top of the box or remove its lid.
- Place objects in the small box so that larger are in the front and smaller are in the back to give the diorama depth.
- Color the inside of the box to resemble space.
- Be creative and have fun!

BIG BANG

FITNESS ACTIVITY

Big Bang Bonkers

Whatcha Need:

Mission Time: 20-30 minutes
Large dedicated area with labels on certain objects for students to tag.

Whatcha Do:

MISSION:

Exercise our minds by memorizing various objects in our Universe, while exercising our bodies by racing from one object to another.

PROCEDURE:

- Predetermine where the *Tag Spots* will be for the following:

- Sun	- Jupiter	- Moons	- Asteroids
- Mercury	- Saturn	- Meteor	- Galileo
- Venus	- Uranus	- Meteorite	- Newton
- Earth	- Neptune	- Meteoroid	- Einstein
- Mars	- Pluto	- Comet	- NASA

- Choose a leader who calls out three *Tag Spots* and then yells, "Bonkers!"
- Players run and touch the *Tag Spots* as quickly as possible in the correct order given by the leader.
- Players can be asked to "touch" the object with different parts of their bodies (hand, foot, elbow, knee, etc.)
- Players can also be asked to move to the object a specific way (run, skip, hop, etc.)

BIG BANG

LIFE SKILLS ACTIVITY

Mister Roboto Laugh-A-Lot-O!

Whatcha Need:

Mission Time: 15-30 minutes
Machine Building Handout, pen or pencil, and your best robot voice.

Whatcha Do:

MISSION:

Learn the benefits of working cooperatively and collaboratively together to achieve a goal.

PROCEDURE:

- Using the Machine Building Handout, break into small groups and design a "machine" with your bodies.
- Machines are meant to explore new planets and need to be properly equipped.
- Once the machine is designed, one member of the group will act as Mission Control and guide the "machine" with their best robot voice to all the planets (areas located throughout the room) giving the "machine" a task to perform upon arrival.
- If the "machine" does not work well together, it can self-destruct.
- Answer the discussion questions on the Machine Building Handout with your group.

BIG BANG

Machine Building Handout

DIRECTIONS:

- Divide into groups of 4-6 people.
- Brainstorm types of equipment that would be necessary on a "machine" designed to explore the planets.
- Decide what function each team member will play and how to act it out.
- Choose a team member to act as Mission Control. Be sure they have a good robot voice.
- Following the directions of Mission Control, the "machine" must visit all of the planets in the Universe and complete its assigned tasks.

DISCUSSION QUESTIONS:

- What did you like about this activity?
- How did your group decide which person in the group would do what part?
- What are some ways a machine is like working with a group?
- What was hard about the activity? Explain.
- Did any part of the machine break? How?
- When part of a machine breaks down, what happens?
- How is a machine breaking down like having a hard time getting along with others?
- What are some things that can be done to help relationships so they don't "break down"?