



# 3...2...1...Lift Off!

## OVERVIEW

In this lesson students will explore the planets and their characteristics. Completing activities in centers, students will select a planet on which they will build a “home,” drawing and describing the physical environment including climate, landforms, natural resources and natural hazards in the form of a brochure advertising their house for sale.

## TIME ALLOTMENT

5 days @ 45 minutes each

([www.tea.state.tx.us/teks/index.html](http://www.tea.state.tx.us/teks/index.html))

## SUBJECT MATTER

This lesson addresses instructional goals in Social Studies and Science and also has curricular ties to Math, English Language Arts, Reading, and Technology Applications

### §110.5 English Language Arts and Reading, Grade 3

(3.1) Listening/speaking/purposes. The student listens attentively and engages actively in various oral language experiences.

- (A) determine the purpose(s) for listening such as to get information, to solve problems, and to enjoy and appreciate (K-3);
- (B) respond appropriately and courteously to directions and questions (K-3);
- (D) listen critically to interpret and evaluate (K-3);

## LEARNING OBJECTIVES

Students will be able to:

1. describe how humans adapt to variations in the physical environment.
2. identify the planets in our solar system and their position in relation to the Sun.
3. use technology to acquire information, solve problems, synthesize and communicate their findings.

(3.4) Listening/speaking/communication. The student communicates clearly by putting thoughts and feelings into spoken words.

- (A) use vocabulary to describe clearly ideas, feelings, and experiences (K-3);
- (B) clarify and support spoken messages using appropriate props, including objects, pictures, and charts (K-3);

## STANDARDS

### TEKS

(3.6) Reading/fluency. The student reads with fluency and understanding in texts at appropriate difficulty levels.

(A) read regularly in independent-level materials (texts in which no more than approximately 1 in 20 words is difficult for the reader) (3);

(3.7) Reading/variety of texts. The student reads widely for different purposes in varied sources.

(B) read from a variety of genres for pleasure and to acquire information from both print and electronic sources (2-3); and (TAKS Obj. 1)

(3.9) Reading/comprehension. The student uses a variety of strategies to comprehend selections read aloud and selections read independently.

(A) use prior knowledge to anticipate meaning and make sense of texts (K-3);  
(B) establish purposes for reading and listening such as to be informed, to follow directions, and to be entertained (K-3);  
(D) monitor his/her own comprehension and act purposefully when comprehension breaks down using such strategies as rereading, searching for clues, and asking for help (1-3);  
(I) represent text information in different ways, including story maps, graphs, and charts (2-3); (TAKS Obj. 3)

(3.10) Reading/literary response. The student responds to various texts.

(C) support interpretations or conclusions with examples drawn from text (2-3); and (TAKS Obj. 4)

(3.12) Reading/inquiry/research. The student generates questions and conducts research using information from various sources.

(D) use multiple sources, including print such as an encyclopedia, technology, and experts, to locate information that addresses questions (2-3);  
(E) interpret and use graphic sources of information, including maps, charts, graphs, and diagrams (2-3);

(F) locate and use important areas of the library media center (2-3);  
(G) organize information in systematic ways, including notes, charts, and labels (3);  
(H) demonstrate learning through productions and displays such as oral and written reports, murals, and dramatizations (2-3);

(3.14) Writing/purposes. The student writes for a variety of audiences and purposes and in various forms.  
(A) write to record ideas and reflections (K-3);  
(B) write to discover, develop, and refine ideas (1-3);  
(C) write to communicate with a variety of audiences (1-3); and  
(D) write in different forms for different purposes such as lists to record, letters to invite or thank, and stories or poems to entertain (1-3).

(3.15) Writing/penmanship/capitalization/punctuation. The student composes original texts using the conventions of written language such as capitalization and penmanship to communicate clearly.

(B) use capitalization and punctuation such as commas in a series, apostrophes in contractions such as can't and possessives such as Robin's, quotation marks, proper nouns

(3.17) Writing/grammar/usage. The student composes meaningful texts applying knowledge of grammar and usage.  
(C) compose elaborated sentences in written texts and use the appropriate end punctuation (3);  
(D) compose sentences with interesting, elaborated subjects (2-3); and  
(E) edit writing toward standard grammar and usage, including subject-verb agreement; pronoun agreement, including pronouns that agree in number; and appropriate verb tenses, including to be, in final drafts (2-3).

(3.18) Writing/writing processes. The student selects and uses writing processes for self-initiated and assigned writing.

(D) edit for appropriate grammar, spelling, punctuation, and features of polished writing (2-3);

(E) use available technology for aspects of writing such as word processing, spell checking, and printing (2-3); and

(F) demonstrate understanding of language use and spelling by bringing selected pieces frequently to final form, "publishing" them for audiences (2-3).

(3.19) Writing/evaluation. The student evaluates his/her own writing and the writing of others.

(B) respond constructively to others' writing (1-3);

(C) determine how his/her own writing achieves its purposes (1-3);

### §111.15 Mathematics, Grade 3

(3.1) Number, operation, and quantitative reasoning. The student uses place value to communicate about increasingly large whole numbers in verbal and written form, including money.

(A) use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999; (TAKS Obj. 1)

(B) use place value to compare and order whole numbers through 9,999; and (TAKS Obj. 1)

(3.4) Number, operation, and quantitative reasoning. The student recognizes and solves problems in multiplication and division situations.

(B) solve and record multiplication problems (one-digit multiplier); and (TAKS Obj. 1)

(C) use models to solve division problems and use number sentences to record the solutions. (TAKS Obj. 1)

(3.5) Number, operation, and quantitative reasoning. The student estimates to determine reasonable results.

(A) round two-digit numbers to the nearest ten and three-digit numbers to the nearest hundred; and (TAKS Obj. 1)

(3.11) Measurement. The student selects and uses appropriate units and procedures to measure length and area.

(A) estimate and measure lengths using standard units such as inch, foot, yard, centimeter, decimeter, and meter; (TAKS Obj. 4)

(3.14) Probability and statistics. The student solves problems by collecting, organizing, displaying, and interpreting sets of data.

(A) collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data; (TAKS Obj. 5)

(B) interpret information from pictographs and bar graphs; and (TAKS Obj. 5)

(3.15) Underlying processes and mathematical tools. The student applies Grade 3 mathematics to solve problems connected to everyday experiences and activities in and outside of school.

(D) use tools such as real objects, manipulatives, and technology to solve problems.

(3.17) Underlying processes and mathematical tools. The student uses logical reasoning to make sense of his or her world.

(A) make generalizations from patterns or sets of examples and nonexamples; and (TAKS Obj. 6)

(B) justify why an answer is reasonable and explain the solution process.

### §112.5 Science, Grade 3

(3.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations.

(B) collect information by observing and measuring;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;  
(D) communicate valid conclusions; and  
(E) construct simple graphs, tables, maps, and charts to organize, examine and evaluate information.

(3.3) Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions.

(3.4) Geography. The student understands how humans adapt to variations in the physical environment.

(A) describe and explain variations in the physical environment including climate, landforms, natural resources, and natural hazards;

(B) compare how people in different communities adapt to or modify the physical environment;

(C) describe the effects of physical and human processes in shaping the landscape;

(3.5) Geography. The student understands the concepts of location, distance, and direction on maps and globes.

(B) use a scale to determine the distance between places on maps and globes;

(3.7) Economics. The student understands the concept of an economic system.

(A) define and identify examples of scarcity;  
(B) explain the impact of scarcity on the production, distribution, and consumption of goods and services;  
(C) explain the impact of scarcity on interdependence within and among communities;

(3.8) Economics. The student understands how businesses operate in the U.S. free enterprise system.

(C) explain how the cost of production and selling price affect profits;

(3.16) Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of sources including electronic technology.

(E) interpret and create visuals including graphs, charts, tables, timelines, illustrations, and maps

(F) use appropriate mathematical skills to interpret social studies information such as maps and graphs.

(3.17) Social studies skills. The student communicates effectively in written, oral, and visual forms.

(B) create written and visual material such as stories, poems, pictures, maps, and graphic organizers to express ideas;

(C) use standard grammar, spelling, sentence structure, and punctuation.

(3.18) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings.

(A) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution;

### §117.11 Art, Grade 3

(3.1) Perception. The student develops and organizes ideas from the environment.

(A) identify sensory knowledge and life experiences as sources for ideas about visual symbols, self, and life events;

(3.2) Creative expression/performance. The student expresses ideas through original artworks, using a variety of media with appropriate skill.

(A) create artworks based on personal observations and experiences;

(C) produce drawings, paintings, prints, constructions, ceramics, and fiber art, using a variety of art materials appropriately.

### §126.3 Technology Applications, Grades 3 -5

(1) Foundations. The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections.

- (A) use technology terminology appropriate to the task;
- (B) save and delete files, uses menu options and commands, and work with more than one software application;
- (E) access remote equipment on a network such as a printer or other peripherals.

(2) Foundations. The student uses data input skills appropriate to the task.

- (A) use a variety of input devices such as mouse, keyboard, disk drive, modem, voice/sound recorder, scanner, digital video, CD-ROM, or touch screen;
- (B) use proper keyboarding techniques such as correct hand and body positions and smooth and rhythmic keystroke patterns;
- (C) demonstrate touch keyboarding techniques for operating the alphabetic, numeric, punctuation, and symbol keys as grade-level appropriate;
- (D) produce documents at the keyboard, proofread, and correct errors;
- (E) use language skills including capitalization, punctuation, spelling, word division, and use of numbers and symbols as grade-level appropriate;

(4) Information acquisition. The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision.

(A) apply appropriate electronic search strategies in the acquisition of information including keyword and Boolean search strategies;

(5) Information acquisition. The student acquires electronic information in a variety of formats, with appropriate supervision.

(A) acquire information including text, audio, video, and graphics;

(7) Solving problems. The student uses appropriate computer-based productivity tools to create and modify solutions to problems.

- (A) use software programs with audio, video, and graphics to enhance learning experiences;
- (B) use appropriate software to express ideas and solve problems including the use of word processing, graphics, databases, spreadsheets, simulations, and multimedia;

(10) Communication. The student formats digital information for appropriate and effective communication.

- (A) use font attributes, color, white space, and graphics to ensure that products are appropriate for the defined audience;
- (B) use font attributes, color, white space, and graphics to ensure that products are appropriate for the communication media including multimedia screen displays, Internet documents, and printed materials; and
- (C) use appropriate applications including, but not limited to, spreadsheets and databases to develop charts and graphs by using data from various sources.

(11) Communication. The student delivers the product electronically in a variety of media, with appropriate supervision.

- (A) publish information in a variety of media including, but not limited to, printed copy, monitor display, Internet documents, and video; and
- (B) use presentation software to communicate with specific audiences.

(12) Communication. The student uses technology applications to facilitate evaluation of communication, both process and product.

(B) evaluate the product for relevance to the assignment or task;

(C) represent the natural world using models and identify their limitations; (TAKS Obj. 1)

(3.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry.

(A) collect and analyze information using tools including calculators, microscopes, cameras, safety goggles, sound recorders, clocks, computers, thermometers, hand lenses, meter sticks, rulers, balances, magnets, and compasses;

(3.7) Science concepts. The student knows that matter has physical properties.

(A) gather information including temperature, magnetism, hardness, and mass using appropriate tools to identify physical properties of matter; and

(B) identify matter as liquids, solids, and gases.

## MEDIA COMPONENTS

### INTERNET

#### Windows to the Universe

<http://www.windows.ucar.edu/tour/link=/windows3.html>

This is a great site for exploring the Solar System and finding basic facts about each planet. At the top of the screen, click on **Beginner** to see larger font. Click on **Our Solar System**, then on **Solar System Facts**, then on one planet at a time.

#### StarChild: A Learning Center for Young Astronomers

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

To print a separate fact sheet for each planet as a reference, click on **Solar System** under Level 1, then **The Planets**, click on one planet at a time, select **Facts**, and print.

#### spaceKids.com

<http://www.spacekids.com/solarsystem/index.html>

At this site, click on **Solar System Central**, then click on one planet at a time (answers questions about surface and temperature). You can also click on **Virtual Tour** and then one planet at a time to collect data on temperatures, etc. (requires **Flash**). **Games**--Planet Pounds, Space Age (requires **Shockwave**).

#### The Observatory at the Exploratorium

<http://www.exploratorium.edu/observatory/index.html>

This site is the Exploratorium's guide to Astronomy resources, such as a link to live photos and video from Mars starting in January 2004.

#### Virtual Postcards

[http://www.windows.ucar.edu/tour/link=/cool\\_stuff/postcards.html](http://www.windows.ucar.edu/tour/link=/cool_stuff/postcards.html)

Part of the **Windows to the Universe** site, this link takes you straight to a site for sending virtual postcards. Click on a planet, select an image, then type in an email address, subject, and message. Preview postcard before sending.

#### Your Weight on Other Worlds

<http://www.exploratorium.edu/ronh/weight/index.html>

Click on this link to enter your weight on Earth, instantly calculating your weight on other planets.

#### NASA site for kids

<http://kids.msfc.nasa.gov/SolarSystem/>

A great resource for images, you can also click on **Weigh In** to check weight on other planets, and on **Age is Relative** to calculate age. To find out facts about the planets, click on **Space Kids: Solar System Tour**, and then the planets one at a time.

### BOOKS

Asimov, Isaac. **A Distant Puzzle: The Planet Uranus**. Milwaukee: Gareth Stevens, 1994.

Asimov, Isaac. **The Red Planet: Mars**. Milwaukee: Gareth Stevens, 1994.

Berger, Melvin. **Do Stars Have Points?** New York: Scholastic, 1998.

Brimner, Larry Dane. **Jupiter**. New York: Children's, 1999.

Brimner, Larry Dane. **Mars**. New York: Children's, 1998.

Brimner, Larry Dane. **Mercury**. New York: Children's, 1998.

Brimner, Larry Dane. **Venus**. New York: Children's, 1998.

Drew, David. **Postcards from the Planets**. Crystal Lake, IL: Rigby, 1991.

Drew David. **Somewhere in the Universe**. Crystal Lake, IL: Rigby, 1991.

Hamilton, John. **The Search for Life on Mars**. Edina, MN: Abdo, 1998.

Kirkwood, Jon. **Looking into Space: Our Solar System**. Brookfield, CT: Cooper Beech, 1998.

Lane, Elaine. **Mars**. New York: Franklin Watts, 1991.

Leedy, Loreen. **Postcards from Pluto: A Tour of the Solar System**. New York: Holiday House, 1993.

Simon, Seymour. **Saturn**. New York: William Morrow, 1985.

Wesbacher, Anne. **Solar System**. Edina, MN: Abdo, 1997.

## VIDEO

KLRN streaming video clips from "The Sky Above: A First Look", specifically

1. "Astronomers and the Technology Used to Explore Space"(01:50)
2. "The Scale of the Solar System," (01:43).

## SOFTWARE

*Excel* by Microsoft Corporation  
A spreadsheet application software available for all platforms.

*Publisher* by Microsoft Corporation  
A desktop publishing application software available for all platforms.

*Word* by Microsoft Corporation  
A word processing application software available for all platforms.

## MATERIALS

### PER CLASS

*Excel*, *Publisher* or *Word* software, computer with **Internet** access, library books for research, 1 set bathroom scales, 10 colors of construction paper, 5 pairs of scissors each for 2 centers, 5 calculators each for 2 centers, paper towels, water bottle spritzer, iron filings, masking tape, pencils or pens for each center, string, 5 yardsticks, and 5 rulers.

### PER COOPERATIVE GROUP

1 copy for each center of Cover Sheet and directions for that Center (#1 "I'm HOW Old?" #2 "I Weigh HOW Much?" #3 "Why is Mars Red?" #4 "First Letter, Remember Better" #5 "Honey, I Shrank the Solar System #6 "Lift Off!" #7 "Postcards From Space"), library books or printouts of facts for each planet.

### PER STUDENT

1 manila folder, 1 paper cup per student, copies of data collection sheets for the Centers: (listed above), computer.

## PREP FOR TEACHERS

1. Duplicate Cover Sheet and directions for each Center.
2. Duplicate Student Data Collection Sheets, "Lift Off" Score Sheet, and "Where in the Universe" rubric.
3. Bookmark the Internet sites from the Media Components (or make a copy of the Hotlist and post on the Student Server). If using one or two classroom computers, create a desktop shortcut to

the Postcard site on one computer and a shortcut to the Excel spreadsheets for weight and age on a second computer.

4. Preset and cue the KLRN streaming video on the Teacher Computer connected to the TV.
5. Set out materials at each Center.

## INTRODUCTORY ACTIVITY: SETTING THE STAGE

1. **FOCUS FOR MEDIA INTERACTION:**  
Ask students if they know what the sky is. What kinds of things can they see in the sky? How could they see things even better as they look at the sky? Are there people who study the sky?
2. After hearing discussion, ask them if they think humans will ever be able to travel to or even live on other planets. Begin video clip after discussion.
3. Have KLRN streaming video clip, “**Astronomers and the Technology Used to Explore Space**” (01:50) loaded onto computer hooked to TV or overhead projector.
4. **PLAY** video clip.
5. Discuss the students’ reactions to watching the clip. Ask the following questions:

Where will the lady’s spaceship be landing in the year 2004?  
What other planets have you heard of?

6. Explain that after watching another short video about the planets, they will be taking turns going to different centers to collect data about how much they would weigh on different planets, how old they would be if they lived there, doing an experiment to find out

why Mars is called “The Red Planet,” making up a sentence to learn the order of the planets according to how far they are from the sun, making a scale model of the planets and their distance from the sun, finding out lift-off facts about the planets, and sending an email postcard about the planet they’ve chosen. They’ll be collecting this data so they can choose one planet they might like to travel to and build a house on. They will be creating a brochure selling their house, telling why their planet is an interesting place to live and giving at least 3 reasons why they would like to live there.

7. **FOCUS FOR MEDIA INTERACTION:**  
Tell the students as they watch the video to notice which planets are closest to and farthest from the sun and why the Earth is called “The Blue Planet.” Ask them to begin thinking about which planet they might want to live on if they could.
8. Have KLRN streaming video clip, “**The Nine Planets**” (01:19) loaded onto computer hooked to TV or overhead projector.
9. **PLAY** video clip.
10. Discuss the students’ reactions to watching the clip. Ask the following questions:

Are there some planets where it might be easier to build a house?

## LEARNING ACTIVITIES

### LEARNING ACTIVITY #1 “I’M HOW OLD?”

1. Materials: Cover sheet and directions for the Center, either a computer with websites bookmarked for research, library books, or fact sheets on the

planets printed from the Internet, student Data Collection sheets, 5 calculators and a stapler.

Internet site:

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

2. **FOCUS FOR MEDIA INTERACTION:** (if there is computer where students have access to the Internet) Students will access the Internet site already bookmarked on computer, clicking on link to each planet, searching for the Revolution Period for each one.
3. Students follow directions, recording the Revolution Period for each planet, their age, and then use calculators to discover their age on other planets, recording their answers in the appropriate column.
4. Once students have made their own calculations, have them open the *Excel* spreadsheet file, I'm HOW Old. Following the directions, the students will type in their names, their teacher's name, and then their own age in the Age column. The computer will automatically calculate their age on the 9 planets.
5. The students will save and print their *Excel* spreadsheet, stapling it to their own Data Collection sheet.
6. (Extension) In the *Excel* Spreadsheet file, I'm HOW Old, students can also click on the tab named Age Chart, and see a graph automatically generated from their data. They can click on View...Header and Footer and type in their name and their teacher's name in the Custom Header, then save and print.
7. (Note) Once the students have recorded the data on the planet's Revolution Periods and calculated their ages on other planets, the entire class could access the spreadsheet at one time in a computer lab.

## LEARNING ACTIVITY #2 "I WEIGH HOW MUCH?"

1. Materials: Cover sheet and directions for the Center, either a computer with websites bookmarked for research, library books, or fact sheets on the planets printed from the Internet, student Data Collection sheets, 1 set of bathroom scales, 5 calculators and a stapler. Internet site: <http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>
2. **FOCUS FOR MEDIA INTERACTION:** (if there is computer where students have access to the Internet) Students will access the Internet site already bookmarked on computer, clicking on link to each planet, searching for the Gravitational Pull for each one.
3. Students follow directions, recording the Gravitational Pull for each planet, weighing themselves on the bathroom scales and then recording their weight, and finally using calculators to discover their weight on other planets, recording their answers in the appropriate column.
4. Once students have made their own calculations, have them open the *Excel* spreadsheet file, I Weigh HOW Much. Following the directions, the students will type in their names, their teacher's name, and then their own weight in the Weight column. The computer will automatically calculate their weight on the 9 planets.
5. The students will save and print their *Excel* spreadsheet, stapling it to their own Data Collection sheet.
6. (Extension) In the *Excel* spreadsheet file, I Weigh HOW Much, students can also click on the tab named Weight Chart, and see a graph automatically generated from their data. They can click on View...Header and Footer and

type in their name and their teacher's name in the Custom Header, then save and print.

7. (Note) Once the students have recorded the data on the planet's Gravitational Pull and calculated their weights on other planets, the entire class could access the spreadsheet at one time in a computer lab.

### LEARNING ACTIVITY #3 "WHY IS MARS RED?"

1. Materials: Cover sheet and directions for the Center, paper cups, masking tape, pencils, paper towels, water bottle spritzer, and iron filings.
2. Students will follow directions, putting their names on masking tape, attaching it to cups, tracing around the cup on a paper towel, inserting the circle into the cup, sprinkling iron filings with water, and setting aside to discover what happens to the filings after time.

### LEARNING ACTIVITY #4 "FIRST LETTER, REMEMBER IT BETTER"

1. Materials: Cover sheet and Student Activity Sheets.
2. Students will follow directions, writing one word for each planet, starting with the beginning letters of the planets, creating a sentence to help them remember the order of the planets in their distance from the sun.
3. After completing their sentences, have students share and learn at least two other students' sentences.

### LEARNING ACTIVITY #5 "HONEY, I SHRANK THE SOLAR SYSTEM"

1. **FOCUS FOR MEDIA INTERACTION:**  
Ask the students what they have learned so far about the planets in the solar system. How big are the planets? Are

they all the same size? Tell them they will be watching a short video comparing the planet's sizes to that of the sun.

2. Prior to having students go to this center, have them watch the KLRN streaming video clip, "The Scale of the Solar System," (01:43). Be prepared to pause the video (at 40 sec) to ask the question, "If the sun is the size of a basketball, how big do you think Jupiter, the Earth, and tiny Pluto would be in comparison?" Resume the video (at 50 sec) after the students have responded.
3. Materials: Cover sheet, directions for the Center, Measurement chart, 10 colors of construction paper, items such as paper cups for students to trace around for 5 different-sized circles, string, 5 yard sticks, 5 rulers, scissors, staplers.
4. Students will follow directions, drawing circles on different colors construction paper, with at least the Sun being yellow, Mars, red, and Earth, blue. They will measure and cut a length of string on which the "planets" will be stapled, and then use rulers to measure the distances for each planet from the sun, stapling the planets in their proper positions.

### LEARNING ACTIVITY #6 "LIFT OFF!"

1. Materials: Cover sheet and directions for the Center, either a computer with websites bookmarked for research, library books, or fact sheets on the planets printed from the Internet, and student Data Collection sheets. Internet address:  
<http://www.windows.ucar.edu/tour/li nk=/windows3.html> or  
<http://www.spacekids.com/solarsyste m/index.html>

2. **FOCUS FOR MEDIA INTERACTION:** (if there is computer where students have access to the Internet) Students will access the Internet sites already bookmarked on computer, clicking on link to each planet, searching for facts for each one.
3. Students will follow directions, collecting and recording data about the planets' temperature range, number of satellites, and the surface, enabling them to decide which planet they want to build their home on and to begin thinking about three reasons they would like to live there.

### LEARNING ACTIVITY #7 "POSTCARDS FROM SPACE"

1. Materials: Cover sheet, directions, paper, computer with Internet access, and computer directions. Internet address:  
[http://www.windows.ucar.edu/tour/link=/cool\\_stuff/postcards.html](http://www.windows.ucar.edu/tour/link=/cool_stuff/postcards.html)
2. Students will follow directions, naming the planet they have selected to build a house on, listing 3 reasons why they would like to live there.
3. **FOCUS FOR MEDIA INTERACTION:** Students will go to the computer set up for sending postcards, click on the desktop shortcut and follow directions for selecting an image, then typing in the email address and message, previewing and sending their postcard.

## CULMINATING ACTIVITY

### WHERE IN THE UNIVERSE?

1. Once the students have collected and recorded their data from the Activity Centers and decided upon the planet where they want to build their home,

they will create a brochure in *Word* or *Publisher*, drawing a picture of their house, listing selling features for the planet they've selected, and writing at least 3 reasons why people might want to live there.

2. Share a rubric with the students of the requirements for their publication.
3. When the students have finished their publications, have them make "sales pitches" to the rest of the class.
4. Have students reflect on which activities they liked the best and why, which they liked the least and why, and how they would improve the activities.
5. Have students reflect on the results of their activities: Do they think humans might travel to and live on other planets and why? Have they changed their minds since they have worked on the activities? If they could travel to or live on a planet, which one do they think would be the most interesting and why?

## CROSS-CURRICULAR EXTENSIONS

### MATHEMATICS/TECHNOLOGY

Students can enter data into ready-made *Excel* spreadsheets for "I'm HOW Old?" and "I Weigh HOW Much?" Then they can click tabs for ready-made charts, save and print, interpreting information from charts as on which planets they'd be the youngest, the oldest, or weigh the least, the most, etc.

Students can learn how to create a spreadsheet of their own, entering data on the class's favorite and least favorite planets, learning how to highlight data and make a chart of their own.

## COMMUNITY CONNECTIONS

## MAKE A MOVIE

Using a camcorder, have the students videotape their class presentations of their brochures, as well as the students' actually working in the Activity Centers. Download the footage to a computer with AV connections. Render the footage and showcase it to a PTA meeting or Grade Level Open House.

## STUDENT MATERIALS

Attach copies of the Cover sheets, directions, and Student Data Collection sheets for each center:

1. Lift Off! Activity Centers Score Sheet.
2. Activity Center #1: "I'm HOW Old?" cover sheet, directions, student Data Collection sheets.
3. Activity Center #2: "I Weigh HOW Much?" cover sheet, directions, student Data Collection sheets.
4. Activity Center #3: "Why is Mars Red?" cover sheet, directions.
5. Activity Center #4: "First Letter, Remember Better" cover sheet, Student activity sheets.
6. Activity Center #5: "Honey, I Shrank the Solar System" cover sheet, directions, Measurement Sheet, color coding directions.
7. Activity Center #6: "Lift Off!" cover sheet, directions, student Data Collection sheets.
8. Activity Center #7: "Postcards from Space" cover sheet, directions, and computer directions.
9. Culminating Activity: "Where in the Universe?" rubrics.

## ADDITIONAL RESOURCES

### Windows to the Universe

<http://www.windows.ucar.edu/tour/link=/windows3.html>

This is a great site for exploring the Solar System and finding basic facts about each

planet. At the top of the screen, click on **Beginner** to see larger font. Click on **Our Solar System**, then on **Solar System Facts**, then on one planet at a time.

### StarChild: A Learning Center for Young Astronomers

<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

To print a separate fact sheet for each planet as a reference, click on **Solar System** under Level 1, then **The Planets**, click on one planet at a time, select **Facts**, and print.

### spaceKids.com

<http://www.spacekids.com/solarsystem/index.html>

At this site, click on **Solar System Central**, then click on one planet at a time (answers questions about surface and temperature). You can also click on **Virtual Tour** and then one planet at a time to collect data on temperatures, etc. (requires **Flash**). **Games**--Planet Pounds, Space Age (requires **Shockwave**).

### The Observatory at the Exploratorium

<http://www.exploratorium.edu/observatory/index.html>

This site is the Exploratorium's guide to Astronomy resources, such as a link to live photos and video from Mars starting in January, 2004.

### Virtual Postcards

[http://www.windows.ucar.edu/tour/link=/cool\\_stuff/postcards.html](http://www.windows.ucar.edu/tour/link=/cool_stuff/postcards.html)

Part of the **Windows to the Universe** site, this link takes you straight to a site for sending virtual postcards. Click on a planet, select an image, then type in email address, subject, and message. Preview postcard before sending.

### Your Weight on Other Worlds

<http://www.exploratorium.edu/ronh/weight/index.html>

Click on this link to enter your weight on Earth, instantly calculating your weight on other planets.

### NASA site for kids

<http://kids.msfc.nasa.gov/SolarSystem/>

A great resource for images, you can also click on **Weigh In** to check weight on other planets, and on **Age is Relative** to calculate age. To find out facts about the planets, click on **Space Kids: Solar System Tour**, and then the planets one at a time.

## EXTENSIONS FOR STUDENTS

An Overview of the Solar System

<http://seds.lpl.arizona.edu/billa/tnp/overview.html>

Click on links to each planet to learn basic facts and lots more.

Views of the Solar System

<http://www.solarviews.com/eng/homepage.htm>

Great resource with lots of text about each planet (annoying pop-up ads).

Welcome to the Planets

<http://pds.jpl.nasa.gov/planets/>  
Images of planets.

BrainPOP: Health, Science, Technology, Math, English Animation and Educational

[http://www.brainpop.com/science/space/solarsystem/index.weml?&tried\\_cookie=true](http://www.brainpop.com/science/space/solarsystem/index.weml?&tried_cookie=true)

Neat quiz and movies, but you can only complete two quizzes before being required to subscribe.

<http://www.brainpop.com/science/space/>  
Just about space (same caution as above).

## FOR TEACHERS

Science Teachers Toolbag at TEA

<http://lucas.tea.state.tx.us/PAI/TTB/links/1,2096,35,00.html>

Lessons with resources (not just astronomy)

Teach Space: Space Science Lessons

[http://www.space.com/teachspace/module\\_astronaut\\_0900/lesson\\_library\\_0900.html](http://www.space.com/teachspace/module_astronaut_0900/lesson_library_0900.html)

Gr 3-8 lesson plans with activities for students to write Space Riddles, build a School Yard-sized Solar System, etc.

Illinois lesson plan--library and teacher collaboration

<http://www.cmi.k12.il.us/%7Eeschombja/guide.htm>

Gr 2-3 lesson plan building a scale model of planets orbiting the sun and flip book of planetary facts.

<http://www.cmi.k12.il.us/%7Eeschombja/rubric.htm>

rubric for above lesson.

NASA/MSU-Bozeman CERES Project--  
Educational Activities

<http://btc.montana.edu/ceres/html/EdActivities.html>

K-12 lesson plans with age appropriate astronomy activities.

Newton's Apple: Teacher's Guides

<http://www.tpt.org/newtons/12/sun.html>

Activities for students to answer the questions: how big is the sun and how far away is it from earth?

**Newton's Apple Season 15: Kids on Mars**

<http://www.tpt.org/newtons/15/kidsmars.html>

Activities for students to create a model of Mars' surface and build vehicles to cross the surface.

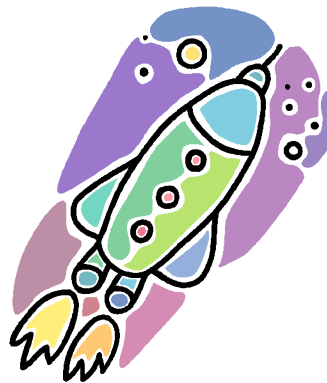
*Thank you to Cheryl Rigual, librarian at Clear Spring Elementary in NEISD for her assistance with this lesson.*

APPENDIX A: ACTIVITY CENTERS COVER SHEET

Name \_\_\_\_\_

Teacher \_\_\_\_\_

## Lift Off! Activity Centers



I'm HOW Old? \_\_\_\_\_

I Weigh HOW Much? \_\_\_\_\_

Why is Mars Red? \_\_\_\_\_

First Letter, Remember it Better \_\_\_\_\_

Honey, I Shrank the Solar System \_\_\_\_\_

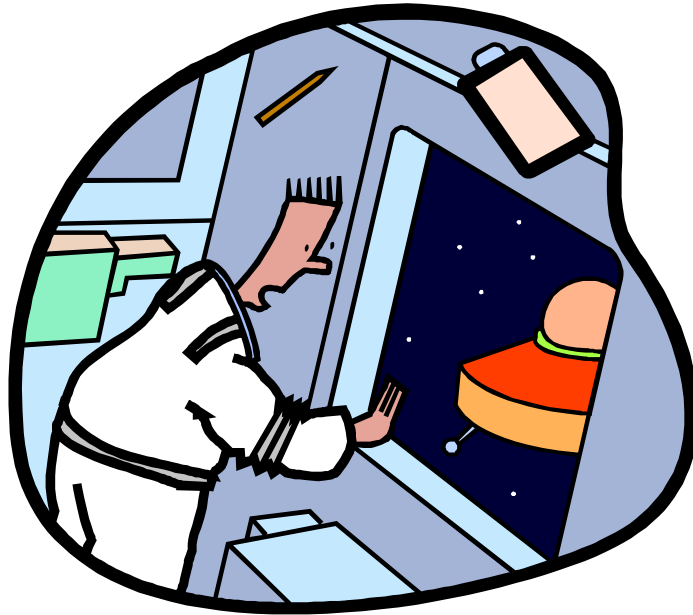
Lift Off! \_\_\_\_\_

Postcards From Space \_\_\_\_\_

Where in the Universe brochure \_\_\_\_\_

APPENDIX B: "I'M HOW OLD?" COVER SHEET

# I'm HOW Old?



APPENDIX C: "I'M HOW OLD?" DIRECTION SHEET

## I'm HOW Old?

### **To Find Your Age on Other Planets:**

On your Data Collection sheet, write down your name and your teacher's name at the top.

Then, write down your current "Earth" age in the **Age** column.

Using either library books, planet information sheets or a computer with Internet access, find the number of days or years it takes for planets to orbit the sun. Write down the number in the column, **Revolution Period**. (Notice the information is already recorded for 3 of the planets—they take only days instead of years to orbit the sun)

Using the calculator, **divide** your age by the revolution period (earth years). The result is your age if you lived on that planet!

Now, check your calculations by opening the computer spreadsheet, **I'm HOW Old?**

First, type in your name and your teacher's name.

Then in the column for your age, type in your age. Press the down arrow, and type in your age on each row.

Save and print your new table. Compare your calculations with those on the spreadsheet.

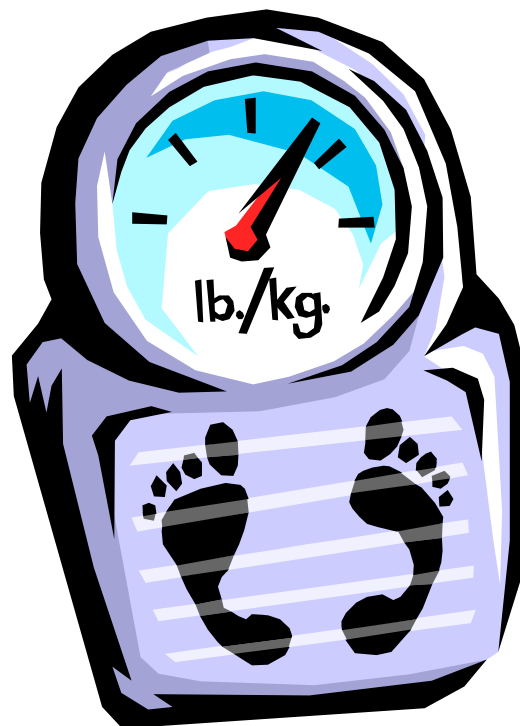
**Extension:** Click on the tab named **Age Chart**. Click on **View...Header and Footer** and type in your name in the Custom Header. Save and print.

APPENDIX D: "I'M HOW OLD?" SPREADSHEET

Your Name:			Teacher:
Planet:	Revolution Period:	Your Age:	Your Age on the Planet:
Mercury	0.24		
Venus	0.62		
Earth			
Mars	1.88		
Jupiter			
Saturn			
Uranus			
Neptune			
Pluto			

APPENDIX E: "I WEIGH HOW MUCH?" COVER SHEET

# I Weigh HOW Much?



APPENDIX F: "I WEIGH HOW MUCH?" DIRECTION SHEET

## I Weigh HOW Much?

### **To Find Your Weight on Other Planets:**

On your Data Collection sheet, write down your name and your teacher's name at the top.

Weigh yourself on the scales and write down your current "Earth" age on your sheet.

Using either library books, planet information sheets or a computer with Internet access, find the Gravitational Pull and write down the number in the column, **Gravitational Pull**.

Using the calculator, **multiply** your weight by the gravitational pull. The result is your weight if you lived on that planet!

Now, check your calculations by opening the computer spreadsheet, **I Weigh HOW Much?**

First, type in your name and your teacher's name.

Then in the column for your weight, type in your weight. Press the down arrow, and type in your weight on each row.

Save and print your new table. Compare your calculations with those on the spreadsheet.

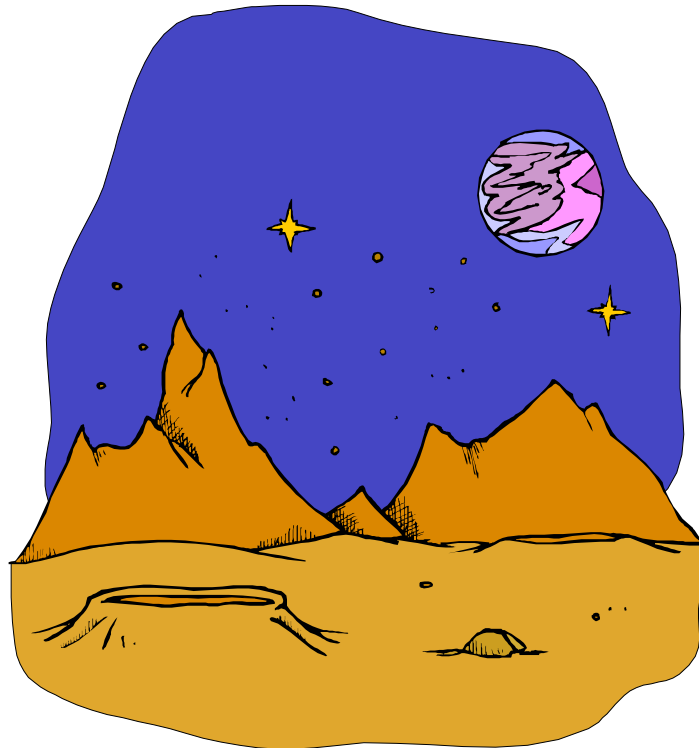
**Extension:** Click on the tab named **Weight Chart**. Click on **View...Header and Footer** and type in your name in the Custom Header. Save and print.

APPENDIX G: "I WEIGH HOW MUCH?" SPREADSHEET

Your Name:		Teacher:	
Planet:	Gravitational Pull:	Your Weight:	Your Weight on the Planet
Mercury			
Venus			
Earth			
Mars			
Jupiter			
Saturn			
Uranus			
Neptune			
Pluto			

APPENDIX H: "WHY IS MARS RED?" COVER SHEET

# Why is Mars Red?



APPENDIX I: "WHY IS MARS RED?" DIRECTION SHEET

## Why is Mars Red?

From Earth, Mars looks like a red disk. Its color is due to iron compounds that have rusted in the soil. Rust cannot form without water and oxygen as well as iron. This strongly suggests that there was once water on Mars.

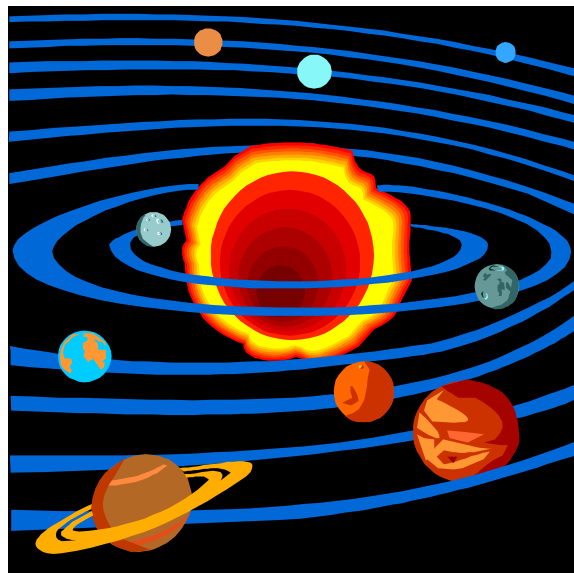
### Your Mission

1. Get a paper cup. Attach a piece of masking tape (about 3 inches long) to the cup.
2. Write your name and teacher's name on the tape.
3. Trace around the bottom of your paper cup on a paper towel to draw a circle. Now cut out the circle and place it in the bottom of the cup.
4. Dampen the paper towel well with a water spritzer.
5. Sprinkle iron filings over the dampened paper towel.
6. Place your cup on the table set aside for your class.
7. The iron eventually turns rusty red, just as once happened on Mars.

Can you guess why the Earth is called the Blue Planet?

APPENDIX J: "FIRST LETTER, REMEMBER BETTER" COVER SHEET

# First Letter, Remember Better

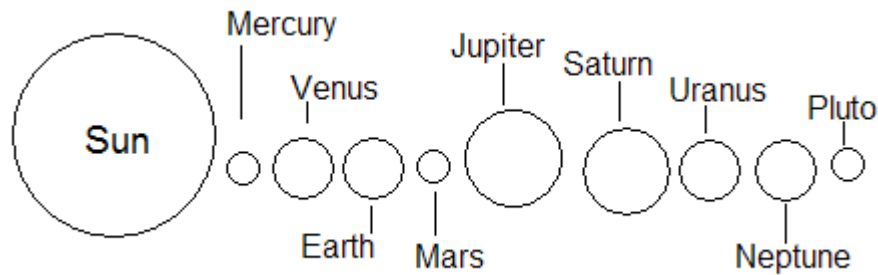


APPENDIX K: "FIRST LETTER, REMEMBER BETTER" DIRECTION SHEET

## First Letter, Remember Better

### How can you remember the order of the planets from the sun?:

Write one word on each line, starting with the first letter of each planet. Teach your sentence to another student and practice at least two other students' sentences.



M \_\_\_\_\_

V \_\_\_\_\_

E \_\_\_\_\_

M \_\_\_\_\_

J \_\_\_\_\_

S \_\_\_\_\_

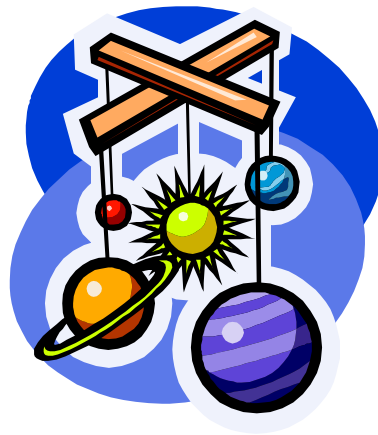
U \_\_\_\_\_

N \_\_\_\_\_

P \_\_\_\_\_

APPENDIX L: "HONEY, I SHRANK THE SOLAR SYSTEM" COVER SHEET

# Honey, I Shrank the Solar System



APPENDIX M: "HONEY, I SHRANK THE SOLAR SYSTEM" ACTIVITY

# Honey, I Shrank the Solar System

(cut these circles from 9 colors of construction paper)

- 1 extra super large (Sun)
- 2 large (Saturn and Jupiter)
- 2 medium (Neptune and Uranus)
- 3 small (Earth, Venus, and Mars)
- 2 extra small (Mercury and Pluto)

~~~~~

(cut these circles from 9 colors of construction paper)

- 1 extra super large (Sun)
- 2 large (Saturn and Jupiter)
- 2 medium (Neptune and Uranus)
- 3 small (Earth, Venus, and Mars)
- 2 extra small (Mercury and Pluto)

APPENDIX N: "HONEY, I SHRANK THE SOLAR SYSTEM" DIRECTION SHEET

## Honey, I Shrank the Solar System

The solar system is very, very big! At this center you will shrink the solar system so you can hang it by the ceiling.

The distances between the planets will give you an idea of how far apart the planets are from each other.

### **Step 1:**

Cut out 10 circles...one for each planet...and one for the Sun. The sun should be yellow. (Write your name and your teacher's name on the back of the sun)

### **Step 2:**

On the front of each circle, WRITE the name of a planet. (You should have 9 circles...one for EACH planet).

On the back of the planet circle, write how many MILES the planet is from the sun AND one fact about the planet.

### **Step 3:**

Cut a piece of string that is  $39 \frac{2}{5}$  inches long. (Use the yardstick to measure).

Staple the sun at the TOP of the string.

### **Step 4:**

Using the chart on the table and a ruler or yardstick, measure the distance of each planet from the sun. Staple the planets to the string.

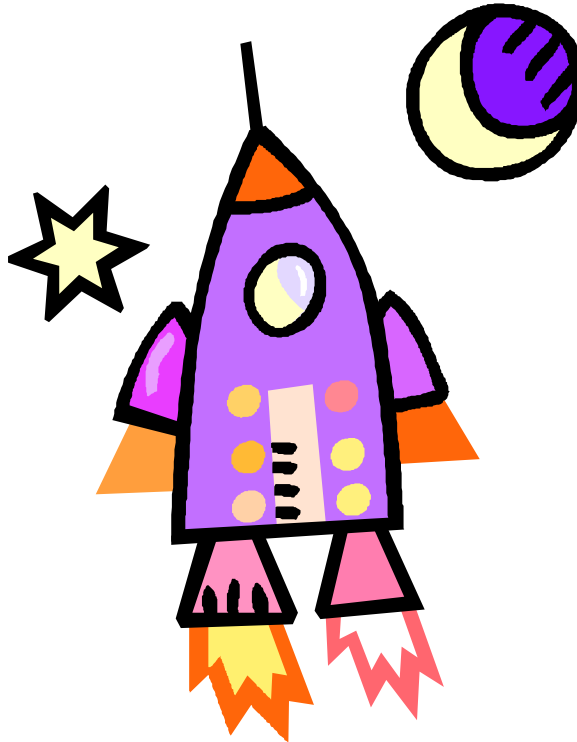
APPENDIX O: "HONEY, I SHRANK THE SOLAR SYSTEM" SPREADSHEET

Honey, I Shrank the Solar System  
(These measurements are distances on the string from  
the sun!)

| <b>Planet:</b> | <b>Measurement</b> |  |  |
|----------------|--------------------|--|--|
| Mercury        | 2/5 inch           |  |  |
| Venus          | 3/4 inch           |  |  |
| Earth          | 1 inch             |  |  |
| Mars           | 1-1/2 inches       |  |  |
| Jupiter        | 7-1/2 inches       |  |  |
| Saturn         | 9-1/2 inches       |  |  |
| Uranus         | 19-1/5 inches      |  |  |
| Neptune        | 30 inches          |  |  |
| Pluto          | 39-2/5 inches      |  |  |

APPENDIX P: "LIFT OFF!" COVER SHEET

# Lift Off!



APPENDIX Q: "LIFT OFF!" DIRECTION SHEET

## Lift Off!

### **To Find Facts About Other Planets:**

To help you decide on which planet you will be building a home, you will need to collect some facts about how far it is to your planet (distance), how hot or cold it is there (temperature range), the number of moons you might see out your window (satellites), and what the surface of the planet is like.

First, write down your name and teacher's name on the **Lift Off Facts sheet**.

Then, using either the books or fact sheets that your teacher has provided (or accessing the Internet), record the data necessary for you to make your decision.

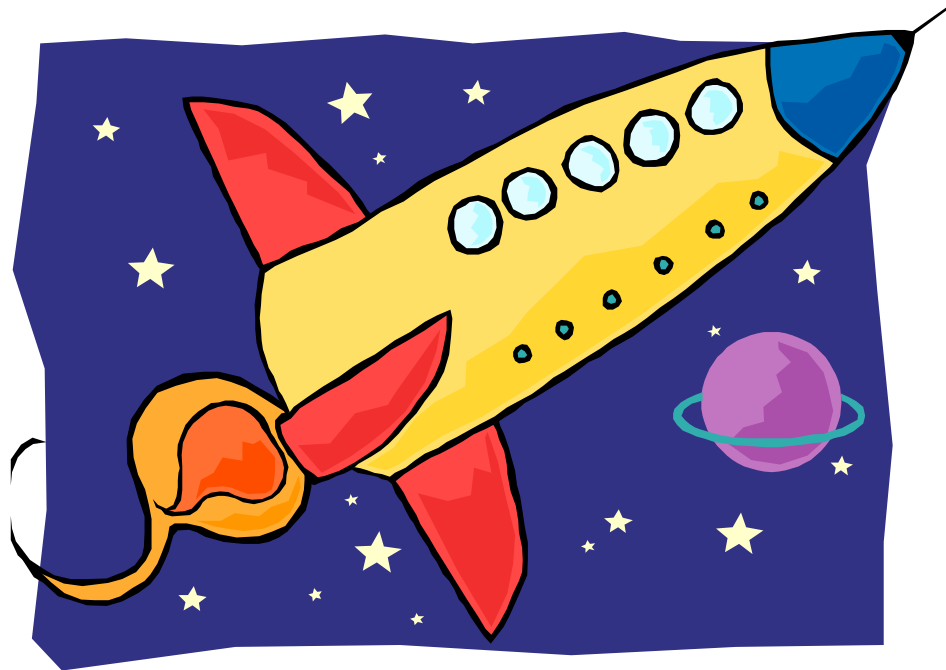
When you are finished, write down the name of the planet where you think you might like to live at the top of the page.

Begin thinking of three reasons why you would like to live on the planet you selected. You can list them on the back of the sheet.

APPENDIX R: "LIFT OFF!" SPREADSHEET

| Your Name: |                                 |                        | Teacher:             |                                         |
|------------|---------------------------------|------------------------|----------------------|-----------------------------------------|
| Planet     | Distance from the earth (miles) | Temperature Range (°F) | Number of Satellites | What is the surface of the planet like? |
| Mercury    |                                 |                        |                      |                                         |
| Venus      |                                 |                        |                      |                                         |
| Earth      |                                 |                        |                      |                                         |
| Mars       |                                 |                        |                      |                                         |
| Jupiter    |                                 |                        |                      |                                         |
| Saturn     |                                 |                        |                      |                                         |
| Uranus     |                                 |                        |                      |                                         |
| Neptune    |                                 |                        |                      |                                         |
| Pluto      |                                 |                        |                      |                                         |

APPENDIX S: "POSTCARDS FROM SPACE" COVER SHEET



# Postcards

# From

# Space

## Postcards From Space

Usually when you go on vacation, you send a postcard to someone to let them know what the place is like where you are visiting.

Well, you are going to email a postcard, using the computer, to tell your teacher, your principal or the school librarian 3 reasons why you've decide to travel to this planet and build a house.

### **Step 1:**

Write your name at the top of a sheet of paper.

### **Step 2:**

Write the name of the planet you have selected for building a house on the first line.

### **Step 3:**

List 3 reasons why you would like to live there.

### **Step 4:**

Go to the **Postcard Computer** and follow the directions at the computer.

APPENDIX U: "POSTCARDS FROM SPACE" COMPUTER DIRECTION SHEET

## Postcards From Space

Now that you have your reasons for selecting a planet where you want to live, you can send a postcard by email to someone and tell them all about that planet.

### Step 1:

Double-click on the icon on the desktop that says Postcard.

### Step 2:

Click on the planet you'll be visiting.

### Step 3:

Click on one of the images you would like to send.

### Step 4:

Compose your postcard by typing in:

- 1) Your parent's, principal's, teacher's, or librarian's email address.
- 2) Your name
- 3) Your teacher's email address
- 4) The name of the planet you're traveling to
- 5) Your message (3 reasons why you want to live there)

### Step 5:

Click on **Preview Postcard**.

### Step 6:

Click on **Send the Postcard**.

### Step 7:

Click on **File...Exit**.

APPENDIX V: "WHERE IN THE UNIVERSE" RUBRIC

**"Where in the Universe" Rubric**

Name: \_\_\_\_\_

Teacher's Name: \_\_\_\_\_

| <b>Publication Rubric</b>                                           | <b>Possible Points</b> | <b>Peer Assessment</b> | <b>Teacher Assessment</b> |
|---------------------------------------------------------------------|------------------------|------------------------|---------------------------|
| Provided interesting and accurate facts about the planet            | 5                      |                        |                           |
| Provided at least 3 reasons why humans might want to live on planet | 5                      |                        |                           |
| Drew a picture of house on the planet                               | 5                      |                        |                           |
| Used correct spelling and punctuation                               | 5                      |                        |                           |
| Presented information clearly                                       | 5                      |                        |                           |
| <b>Total Possible Points</b>                                        | <b>25</b>              |                        |                           |

**Rate each category according to the following scale:**

5=Excellent, 4=Very Good, 3=Good, 2=Satisfactory, 1=Poor, and 0=Unsatisfactory