



National Aeronautics and
Space Administration

Educational Product

Educators &
Students

Grades
K-4

EG-2002-12-012-GRC

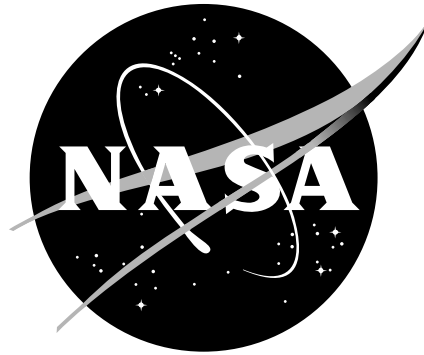
Johnny's Airport Adventure:

An Aeronautics-Based Storyboard and Role-Play Activity



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An Aeronautics-Based Storyboard and Role-Play Activity



National Aeronautics and Space Administration

**NASA Glenn Research Center
Cleveland, Ohio**

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Standards Matrix


























National Science Standards		Systems, order, and organization	Change, constancy, and measurement	Form and function	Properties of objects and materials	Position and motion of objects	Objects in the sky	Abilities of technological design	Understanding about science and technology	Personal health
Activity Matrix										
Activity 1	Role-Play									
Activity 2	Storyboard Airport Terms									
Activity 3	Labeling Worksheet									
Activity 4	Engine Terms									
Activity 5	Shape Matching									
Activity 6	Measurement Worksheet									
Activity 7	Time Changes Worksheet									
National Council of Teachers of Mathematics National Mathematics Standards		Problem solving	Reasoning	Geometry	Measurement					
Activity Matrix										
Activity 1	Role-Play									
Activity 2	Storyboard Airport Terms									
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Activity 7	Time Changes Worksheet									

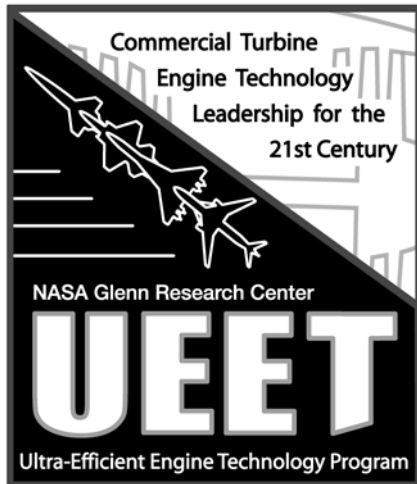


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Johnny's Airport Adventure Project Description



Johnny's Airport Adventure was developed by the Ultra-Efficient Engine Technology (UEET) Program at NASA Glenn Research Center in Cleveland, Ohio, to promote an interest in airplanes and air transportation in the young student. This educator guide consists of seven activities including a storyboard and role-play activity. The storyboard focuses on introducing K–4 students to airport and aircraft terminology including the identification of various engine types. The accompanying role-play story of Johnny's Airport Adventure takes children on a pretend trip to the airport and then on an airplane from Cleveland to San Diego, California. Complete with cutout characters, labels, and aircraft, Johnny's Airport Adventure Educator's Guide also includes worksheets and a list of suggested props to use with the role-playing activity.

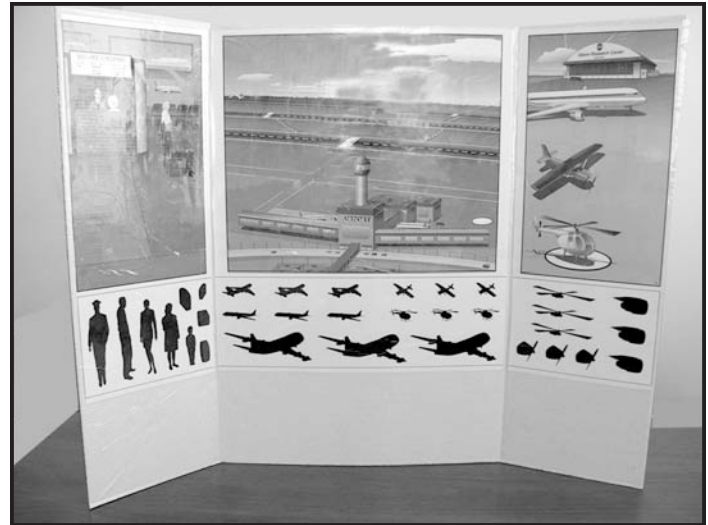
The UEET project is NASA's turbine engine technology program dedicated to continuing the long-standing leadership role played by NASA in developing and transferring technologies required by U.S. manufacturers. The technologies being developed will enable U.S. companies to design future generations of commercial gas turbine engines that will be leaders in the world aerospace marketplace. The future engines that benefit from these technologies will be cleaner burning and more fuel efficient than current aircraft engines.



Build a Storyboard

Teacher Instructions

The artwork in this package contains pictures of an airport, the inside of an airport terminal, and a NASA airplane hangar. The pictures have been sized to fit the dimensions of a standard science fair project board. Also included is a complete set of airport labels and pictures of various aircraft and engines to be laminated and cut out. The instructions below describe how to build the freestanding storyboard with moveable labels and aircraft.

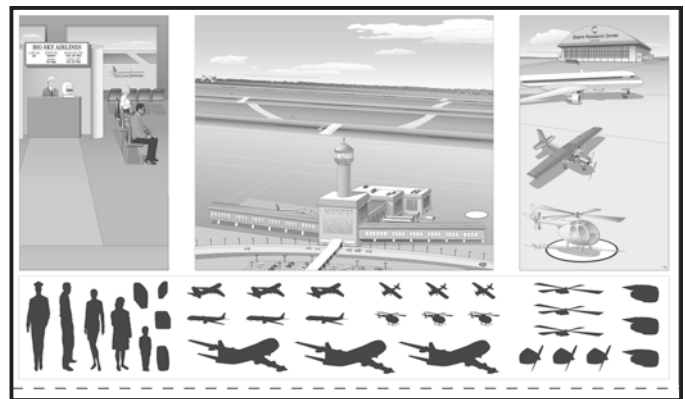


Materials

For the storyboard

- Freestanding 36- by 48-in. science fair project board (available at most office or school supply stores)
- Airport scene poster (included)
- Scissors
- Spray adhesive or glue
- Clear contact paper (optional)

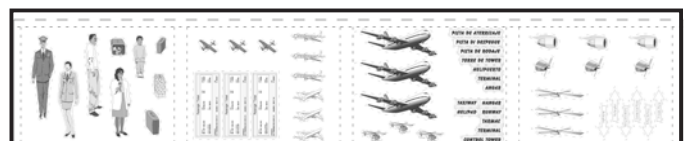
Airport poster



For the labels and cutouts

- Airport labels and cutouts (included)
- Scissors
- Tape or sticky tack
- Laminating machine or clear contact paper (optional)

Labels and cutouts



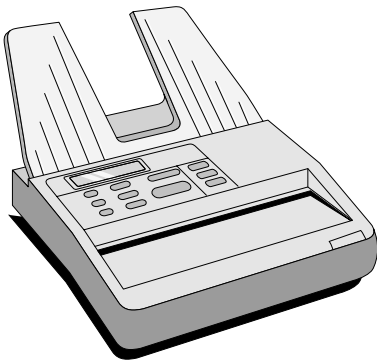
Supplies Needed



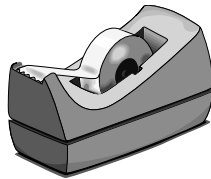
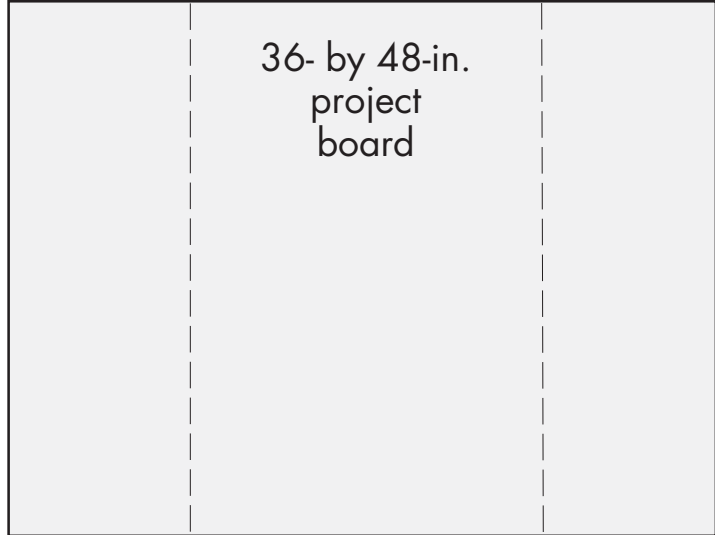
Spray adhesive



Scissors



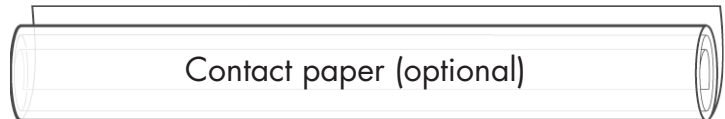
Laminating machine
(optional)



Tape



Glue



Storyboard Assembly

1. Unfold poster illustrating the airport, terminal, and hangar. Cut along horizontal dotted line to separate cutouts and labels from poster.



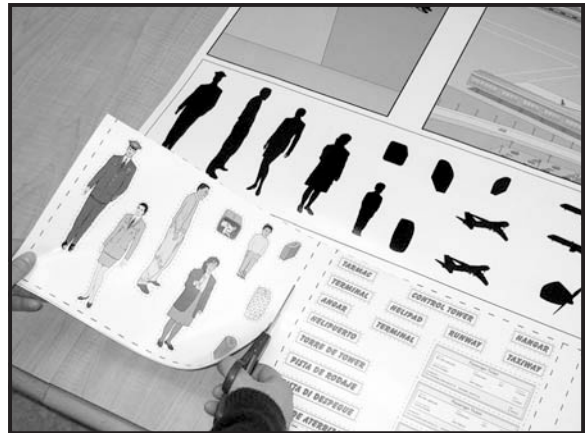
2. Glue poster to open 36- by 48-in. project board.



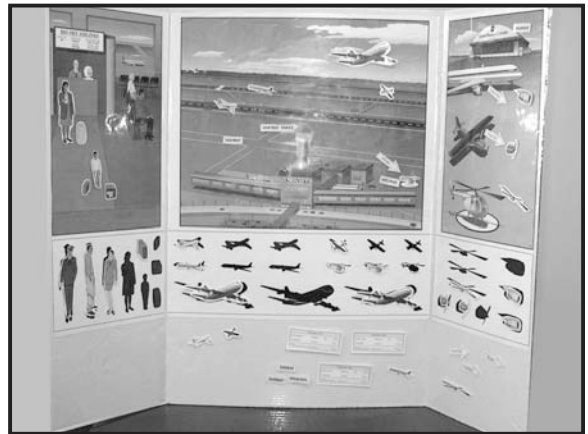
3. Place clear contact paper over poster and board (optional but recommended).



4. From cutout section, cut along dotted lines separating it into four 8.5- by 11-in. sheets for the option of laminating them. Next, cut along dotted lines separating the various airport items.



5. Using tape or sticky tack, attach the cutouts to the bottom of the poster board for storage.



Role-Play

Objectives

The students will

1. Listen as the teacher reads “Johnny’s Airport Adventure”
2. Act out their own version of “Johnny’s Airport Adventure”

Standards

Systems, order, and organization
Understandings about science and technology
Form and function
Personal health



Description

Johnny’s Airport Adventure role-play activity has been designed by NASA’s Ultra-Efficient Engine Technology Office to familiarize students with basic airport terminology. Due to the ongoing changes in airport security, the educator may also choose to use this activity as an opportunity to promote the overall positive and exciting experience associated with commercial air travel to young children.

The make-believe story, “Johnny’s Airport Adventure,” focuses on a young boy and his family as he journeys to the airport for his first airplane ride. Using the role-play activity, students can act out Johnny’s adventure in the classroom as well as address any concerns they may have about flying.

Time Requirements

10 minutes to read story to students
20 minutes to act out story

Materials

Copy of “Johnny’s Airport Adventure” story (page 9)
Props—See “Suggested List of Props” (page 7)

Procedure

1. Read aloud the story of Johnny’s airport adventure.
2. Explain to the students that they are now going to do their own play about Johnny’s airport adventure.
3. Arrange five or more chairs to model the inside of an airplane (i.e., one for the pilot and two rows of three for passengers).
4. Decide on a location in the room to be the airport terminal and ticket counter.



5. Select students to play the role of Johnny, his mom, dad, flight attendant(s), pilot(s), grandma, and grandpa (additional roles may include baggage handlers, security guards, air traffic controllers, and other passengers).
6. Hand out props to the corresponding young actors/actresses (i.e., give a tie to Johnny's dad).
7. Choose a student to be the narrator or select an adult if the students are nonreaders.
8. Narrate the story one scene at a time allowing the actors/actresses to re-create the scenes. Encourage students to ad lib their parts.

Background Information

The story "Johnny's Airport Adventure" is also available in illustrated form on the UEET Web site <http://www.ueet.nasa.gov/StudentSite/>

FAQ's

Where can I get replacements for the pilot and flight attendant's badges as well as the pilot's wings that were included in the kit?

Visit the "UEET Kid's site" at <http://www.ueet.nasa.gov/StudentSite/>

Assessment

Students should use their own imaginations and enthusiasm to re-create Johnny's Airport Adventure using the correct airport terms introduced in the story.

Suggested List of Props

Airport Terminal and Plane

Chairs—five or more arranged to resemble the inside of an airplane

Desk—to be used as a ticket counter and baggage area

Johnny

Backpack or small suitcase (also can be used to store props and materials)

Deck of playing cards

Stuffed animal to be Johnny's pet dog Bandit

Dad

Airline tickets (included)

Tie

Mom

Costume jewelry

Small purse

Grandma

Eyeglasses

Costume jewelry

Straw hat



Activity 1

Grandpa

Tie

Hat

Pilot, co-pilot, flight attendants, baggage handlers, and ticket agents

ID tags (included)

Airplane wings (included)



Johnny's Airport Adventure

(A role-playing activity for students in grades K–4)

Before starting:

1. Choose volunteers to be Johnny, mom, dad, pilot, flight attendant, grandma, and grandpa.
2. Hand out props as follows: dad = tie and tickets, mom = purse and necklace, flight attendant = namebadge, pilot = namebadge and sticker wings, grandma = glasses, Johnny = playing cards and backpack.
3. Arrange about four to six chairs to represent the inside of an airplane. Do not forget a chair for the pilot in the cockpit!
4. Set up a map of the United States.

Scene 1

Johnny and his parents are getting ready to take a trip on an airplane to sunny San Diego, California. Johnny's grandparents live there and he can't wait to see them. His dog Bandit is coming too. This will be Johnny and Bandit's first airplane ride and they are very excited. Johnny looks with Bandit to find California on a map of the United States. It is very far away from their home in Cleveland, Ohio.

Scene 2

"Time to go," says Mom. Johnny helps Bandit into his crate. He makes sure he has plenty of food and water for the long trip. Dad carries Bandit to the car and puts him on the seat next to Johnny for the ride to the airport.

Scene 3

They arrive at the airport terminal and check their baggage inside and receive their boarding passes. The airline workers will make sure each of their suitcases is placed on the plane flying to San Diego, California. "But what about Bandit?" cries Johnny, "Why can't he ride next to me in the airplane?" The baggage handler tells Johnny, "Bandit is not allowed in the plane with the passengers. He gets to ride in a special place in the bottom of the plane with all the other animals. We will take good care of him. Don't worry!" He pats Johnny on the back.

Scene 4

Johnny and his parents walk through the large metal detectors for security. There are many people there. "This **terminal** is a very busy place," says Johnny as he holds tightly onto his mother's hand. Dad looks for a place to sit and relax while waiting to board the airplane. Johnny runs to the seats by the window to see if he can spot Bandit's crate being loaded onto the airplane.

Scene 5

Soon the flight attendant announces, "We will now begin boarding flight 326 to San Diego." Johnny picks up his backpack and lines up to get on the airplane. The pilot meets Johnny as he walks onto the plane. He gives Johnny a pilot's wing sticker and lets him peek into the **cockpit**. "Can I have another sticker for my dog?" asks Johnny. "He is riding on the plane too."



Scene 6

Inside the plane, Johnny and his parents find their seats. They watch the flight attendant demonstrate how to buckle their seat belts. Johnny sits by the window so he can see the beautiful view from the airplane. He can see the workers on the **tarmac** as they load baggage onto the plane. Johnny's dad points out the airplane's wing and engine. "Where is Bandit, Dad?" asks Johnny, "I don't see him." "Don't worry, Johnny! I am sure he is just fine and already on the plane," replies Dad. "But I don't see his crate. What if they forgot to put him on the plane?" cries Johnny. Dad explains to Johnny that there are tags on the crate that show the workers where Bandit is going. He reassures him that Bandit is probably already on the plane.

Scene 7

VROOM! The plane starts its engines and begins moving down the **taxiway** toward the **runway** to take off. Johnny says, "This is fun." Suddenly, as the plane climbs up into the sky he begins to feel pressure in his ears. Johnny's mom gives him some gum to chew. This helps his ear to "pop" and feel better.

Scene 8

Johnny watches out the window as the buildings and cars keep getting smaller and smaller. He can see the NASA sign on the **hangar** below. "Look, Dad, there is the NASA hangar!" yells Johnny. "Do you remember what NASA stands for?" asks his dad. "NASA is the name of the National Aeronautics and Space Administration. That is where Mom works to improve airplane engines." says Dad. The flight attendant begins to serve snacks and drinks to the passengers. Johnny pulls down his tray from the back of the seat in front of him to get ready for his snack.

Scene 9

After the snack, the pilot announces over the loud speaker that the flight will take about 4 hours. He still can't stop thinking about Bandit. He wonders if he is eating his food too. Johnny decides to play cards with his dad to pass the time.

Scene 10

Soon the pilot announces that they are flying over San Diego. He lowers the plane's landing gear. Johnny can see the city below from his window seat. After landing, his dad points out the tall control tower by the **terminal**. "What is that?" asks Johnny. "That is where the air traffic controllers talk to the pilots and give them instructions," replies Dad.

Scene 11

As they walk off the plane, Johnny sees his grandma and grandpa waiting for him in the terminal. He runs to give them a great big hug. They ask him about his airport adventure. "I had so much fun," says Johnny, "But where is Bandit?" "I'll bet he is waiting for us downstairs in the terminal," explains Grandpa, "Let's go pick him up!"



Scene 12

Johnny and his family walk to the baggage area and pick up their luggage. There is no sign of Bandit. Johnny is worried. "Where is he?" cries Johnny.

Scene 13

"Woof, Woof." All of a sudden Johnny can hear a dog barking. "It's Bandit!" yells Johnny as he turns around and finds the baggage handler carrying a crate. Johnny gives Bandit the biggest hug ever.



Las Aventuras de Johnny en el Aeropuerto

(Una actividad de juego de roles para estudiantes entre los grados K-4)

Antes de Comenzar:

1. *Elegir voluntarios para ser Johnny, Mamá, Papá, piloto, asistente de vuelo, abuela y abuelo.*
2. *Accesorios para repartir como sigue: Papá = corbata y boletos, Mamá = cartera y collar, asistente de vuelo = distintivo con el nombre, Piloto = distintivo con el nombre y pegatina con alas, abuela = anteojos, Johnny = cartas de juego y mochila.*
3. *Organizar entre 4 a 6 sillas para representar el interior de un avión. ¡No olvidar una silla para el piloto en la cabina!*
4. *Mostrar y colgar un mapa de los EE.UU.*

Escena 1

Johnny y sus papás se están preparando para hacer un viaje en avión a la asoleada ciudad de San Diego en California. Los abuelos de Johnny viven allí y él está ansioso por verlos. Su perro Bandido también va con él. Este va a ser el primer viaje en avión de Johnny y Bandido, y están muy emocionados. Johnny junto a Bandido miran un mapa de EE.UU. para encontrar California. Está muy lejos del hogar de ellos en Cleveland en Ohio.

Escena 2

“Hora de irse”, dice la mamá. Johnny ayuda a Bandido a entrar a su jaula. Él se asegura que para el largo viaje el perrito tenga suficiente comida y agua. Para viajar al aeropuerto, el papá lleva a Bandido al auto y lo coloca en el asiento al lado de Johnny.

Escena 3

Llegan al terminal aéreo y revisan adentro su equipaje y reciben las tarjetas de embarque. Los empleados de la aerolínea se asegurarán que cada una de sus maletas se encuentre en el avión que vuela rumbo a San Diego en California.

“¿Pero qué sucede con Bandido?”, “¿Por qué no puede viajar junto a mí en el avión?” dice Johnny llorando.

El despachador de equipaje le dice a Johnny: “no está permitido llevar a Bandido en el avión junto a los pasajeros y por eso tiene que viajar en un lugar especial en el fondo del avión con todos los otros animalitos. Nosotros vamos a cuidar muy bien de él. ¡No te preocupes!”. Le dice finalmente a Johnny, dándole una palmadita en su espalda.

Escena 4

Johnny y sus papás caminan por seguridad, a través de un gran detector de metales. Hay mucha gente allí. “Este **terminal** está muy lleno”, dice Johnny mientras aprieta bien la mano de su mamá. El papá busca un lugar para sentarse y descansar mientras espera abordar el avión. Johnny corre hacia los asientos cerca de la ventana para ver si puede reconocer la jaula de Bandido cuando es cargado en el avión.



Escena 5

Pronto el asistente de vuelo anuncia, “vamos a comenzar ahora a abordar el vuelo 326 con destino a San Diego”. Johnny toma su mochila y hace cola para entrar al avión. El piloto se encuentra con Johnny cuando caminaba hacia el avión. Él le regala a Johnny una pegatina de alas para pilotos y le deja echar una miradita en la cabina. “¿Puedo tener otra pegatina para mi perro? El va a viajar en el avión también” dice Johnny.

Escena 6

Ya dentro del avión, Johnny y sus papás encuentran sus asientos. Luego miran al asistente de vuelo que está mostrando cómo abrocharse los cinturones de seguridad. Johnny se sienta junto a la ventana para poder ver la hermosa vista desde el avión. Él puede ver a los empleados en la pista de despegue, cuando están cargando el equipaje en el avión. El papá de Johnny apunta hacia las alas y el motor del avión.

“¿Dónde está Bandido, papá?”, pregunta Johnny. “No lo veo”, dice.

“¡No te preocupes Johnny! Estoy seguro que ya está en el avión y muy bien”, responde el papá.

“Pero no veo su jaula. ¿Qué pasa si olvidaron ponerlo en el avión?”, dice llorando Johnny.

El papá le explica a Johnny que existen etiquetas en las jaulas que les indican a los empleados el lugar donde está yendo Bandido. Él le asegura a Johnny que probablemente Bandido ya está en el avión.

Escena 7

VRUUM! El avión enciende sus motores y comienza a moverse por la **pista de rodaje** hacia la **pista de despegue y aterrizaje**, y Johnny dice, “esto es divertido”.

De repente, cuando el avión subía por el cielo, Johnny empezó a sentir presión en sus oídos y su mamá le dio una goma de mascar para que masticara y ayudara así a “destapar” sus oídos y sentirse mejor.

Escena 8

Johnny mira por la ventana cómo los edificios y autos se van haciendo más y más pequeños. Abajo en la tierra puede ver un **hangar** con el signo de la NASA.

“¡Mira papá hay una hangar de la NASA!”, grita Johnny.

“¿Te acuerdas lo que significa NASA?”, pregunta su papá.

“NASA es el nombre para la Administración Nacional de Aeronáutica y el Espacio. Es ahí donde mamá trabaja para mejorar los motores de los aviones”, dice el papá.

El asistente de vuelo comienza a servir bocadillos y refrigerios a los pasajeros. Johnny baja su bandeja que está en la parte de atrás del asiento en frente de él, para estar listo para comer su bocadillo.



Escena 9

Después del bocadillo, el piloto anuncia por medio del alto parlante que el vuelo va a durar alrededor de cuatro horas. Pero Johnny no puede dejar de pensar en Bandido y se pregunta si también está comiendo su comida. Johnny decide jugar a las cartas con su papá para pasar el tiempo.

Escena 10

Pronto el piloto anuncia que están volando sobre San Diego y comienza a bajar el tren de aterrizaje del avión. Johnny puede ver abajo la ciudad, a través de la ventana de su asiento. Después de aterrizar, su papá apunta a la alta torre de control en el **terminal**.

“¿Qué es eso?”, pregunta Johnny.

“Eso es donde los controladores de tráfico les hablan a los pilotos y les dan las instrucciones”, responde el papá.

Escena 11

Mientras están saliendo del avión, Johnny ve a sus abuelitos esperando por él en el terminal, y corre para darles un gran abrazo. Ellos le preguntan sobre su aventura en el aeropuerto.

“Me divertí muchísimo, pero ¿dónde está Bandido?”, dice Johnny.

“Te apuesto que está esperando por nosotros abajo en el terminal” dice el abuelito, “¡vamos a recogerlo!”.

Escena 12

Johnny y su familia caminan hacia el área de entrega de maletas para recoger el equipaje, pero no hay ninguna señal de Bandido. Johnny está preocupado.

“¿Dónde está?”, pregunta Johnny llorando.

Escena 13

“Guau, Guau”, de repente Johnny puede oír a su perro ladrando.

“¡Es Bandido!” grita Johnny mientras gira su cabeza encontrándose con el despachador de equipaje que trae la jaula, y finalmente Johnny le da el más grande de los abrazos a Bandido.



Storyboard Airport Terms

Objective

The students will

1. Demonstrate their knowledge of airport terminology and operations by correctly labeling the parts of an airport using the labels supplied in this educator guide.

Standards

Position and motion of objects

Objects in the sky

Understandings about science and technology

Abilities of technological design

Description

The Johnny's Airport Adventure storyboard is an interactive, hands-on activity designed to reinforce the topics introduced in "Johnny's Airport Adventure Story." The airport terms activity allows students to match airport terms to their corresponding pictures on the storyboard. Students are also encouraged to use their own imaginations as they place characters and aircraft on the storyboard, building upon the ideas introduced in the story.

Time Requirements

20 minutes

Materials

Assembled storyboard (page 2)

Labels

Tarmac

Runway

Taxiway

Terminal

Helipad

Control tower

Fun tack or tape

Cutouts

Helicopter

Jets

Johnny

Dad

Mom

Flight attendant

Pilot

Bandit

Private plane



Procedure

1. Read aloud the story “Johnny’s Airport Adventure” (pages 9–11) making sure to emphasize and explain the highlighted words.
2. Present the storyboard and display it in an area that is easily accessible to the students.
3. Call on students to correctly identify parts of the airport.
4. Have the students place the correct label on the board using tape or sticky tack (i.e., stick the label “terminal” on the picture of the terminal on the storyboard).
5. Encourage students to also place the cutouts of the various aircraft and characters on the storyboard where they feel they belong.

Background Information

Refer to the glossary and the activity #3 “Label Answer Sheet” (page 20) for the correct placement of the labels.

FAQ’s

Where can I get additional cutouts and labels?

Copies of the cutouts and labels can be downloaded from the “UEET Kid’s site” at <http://www.ueet.nasa.gov/StudentSite/>

Assessment

Students should be able to correctly label the airport. Further assessment can be given by having the students complete the activity #3 “Labeling Worksheet.”



Labeling Worksheet

Objectives

The students will

1. Label the parts of an airport on a worksheet using the storyboard as a guide.
2. Sharpen their fine motor skills by cutting out and pasting the terms on the paper.

Standards

Position and motion of objects

Objects in the sky

Understandings about science and technology

Abilities of technological design

Description

The activity #3 "Label Worksheet" was created to reinforce the material presented in activity #2 above. Students are directed to cut out and paste airport terms into their corresponding boxes on the picture of the airport.

Time Requirements

10 minutes

Materials

Storyboard

Label the parts of the airport worksheet

Scissors

Glue

Procedure

1. Review the material from activity #2 leaving the correctly labeled storyboard in student's view.
2. Hand out one worksheet per student.
3. Have students cut out the terms on the bottom of the worksheet and glue them to their corresponding boxes on the worksheet.
4. Students may refer to the labeled storyboard for help.

Background Information

Refer to the glossary and activity #2.

Assessment

Student answers should be checked to the answer key provided (page 20).

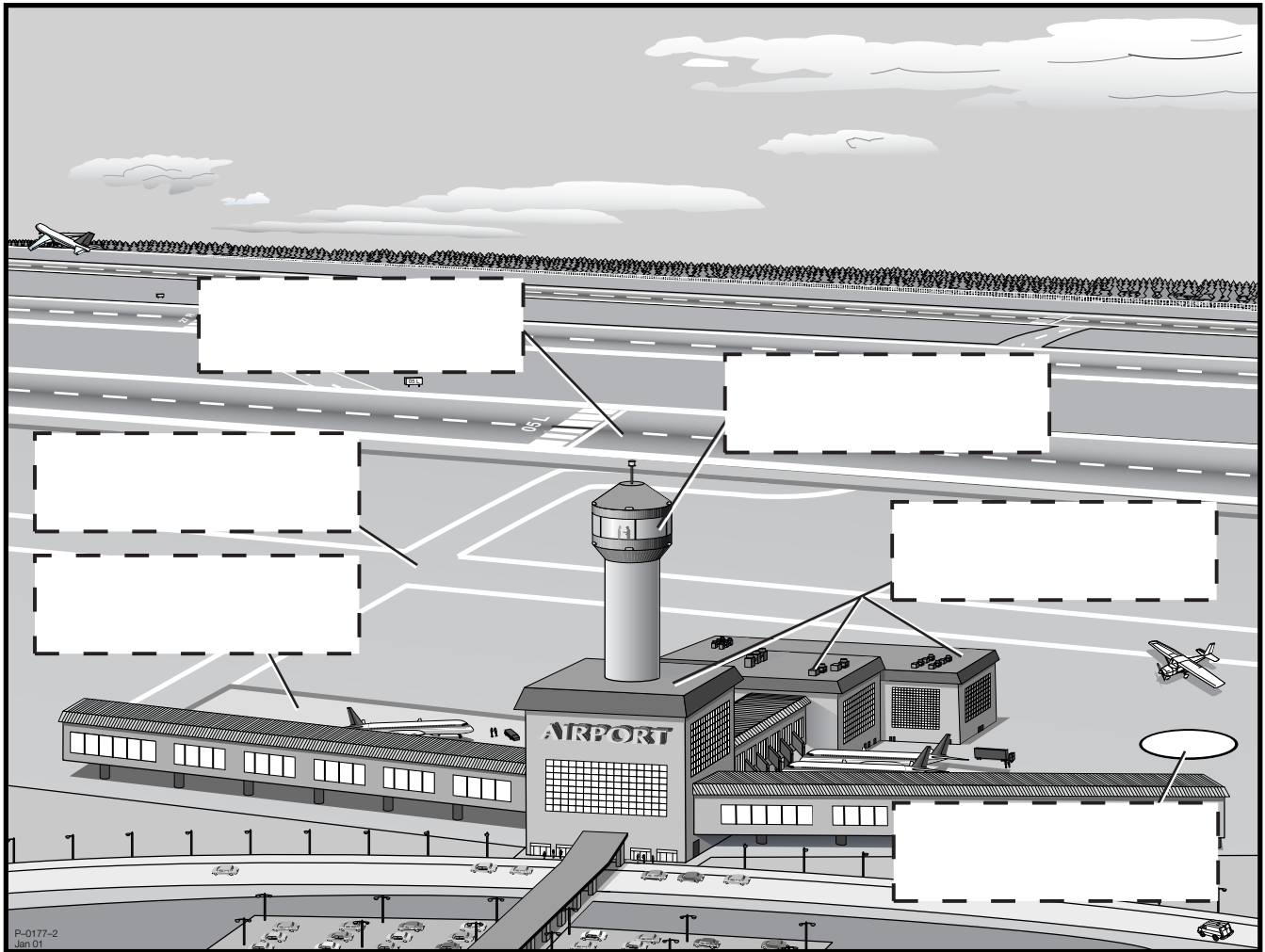


Name _____

Class _____

Label Worksheet

Cut and label the parts of the airport in the boxes below.



Terminal

Runway

Taxiway

Control Tower

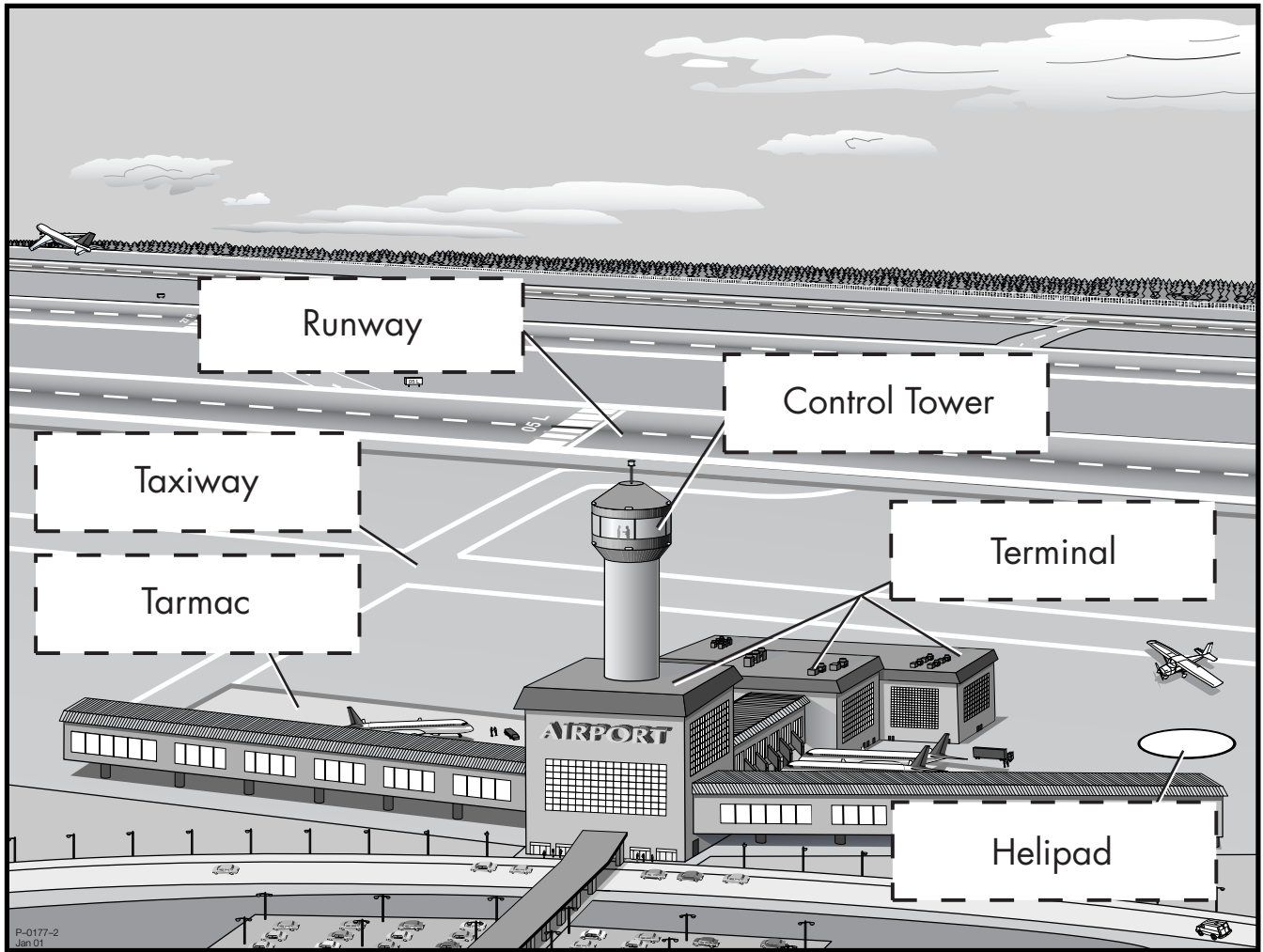
Tarmac

Helipad



Label Answer Sheet

Cut and label the parts of the airport in the boxes below.

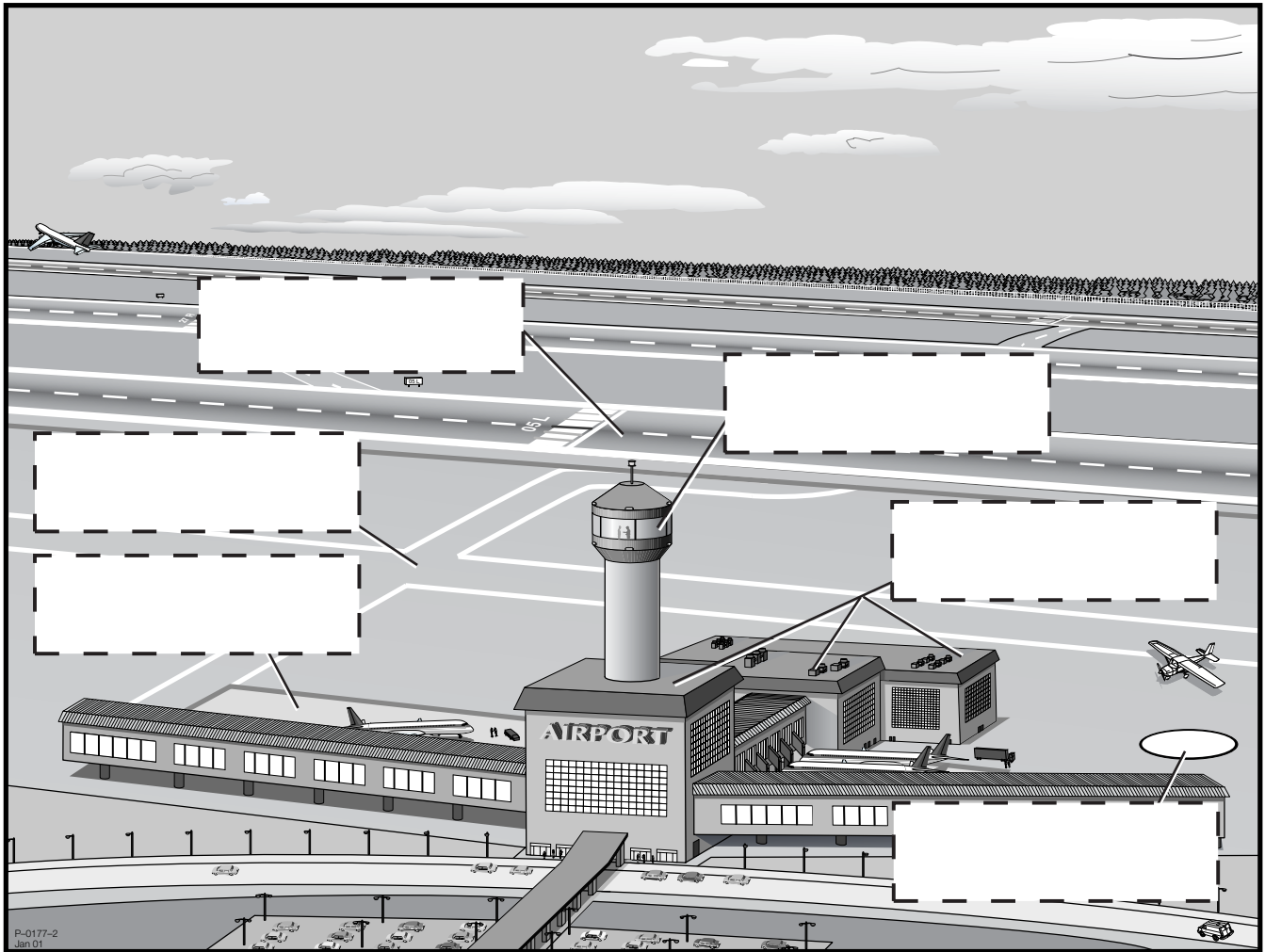


Nombre _____

Clase _____

Hoja de Trabajo de Etiquetas

Clasifique las partes del aeropuerto en las cajas mostradas abajo.



Pista de Rodaje

Zona de Helicópteros

Pista de Aterrizaje

Torre de Control

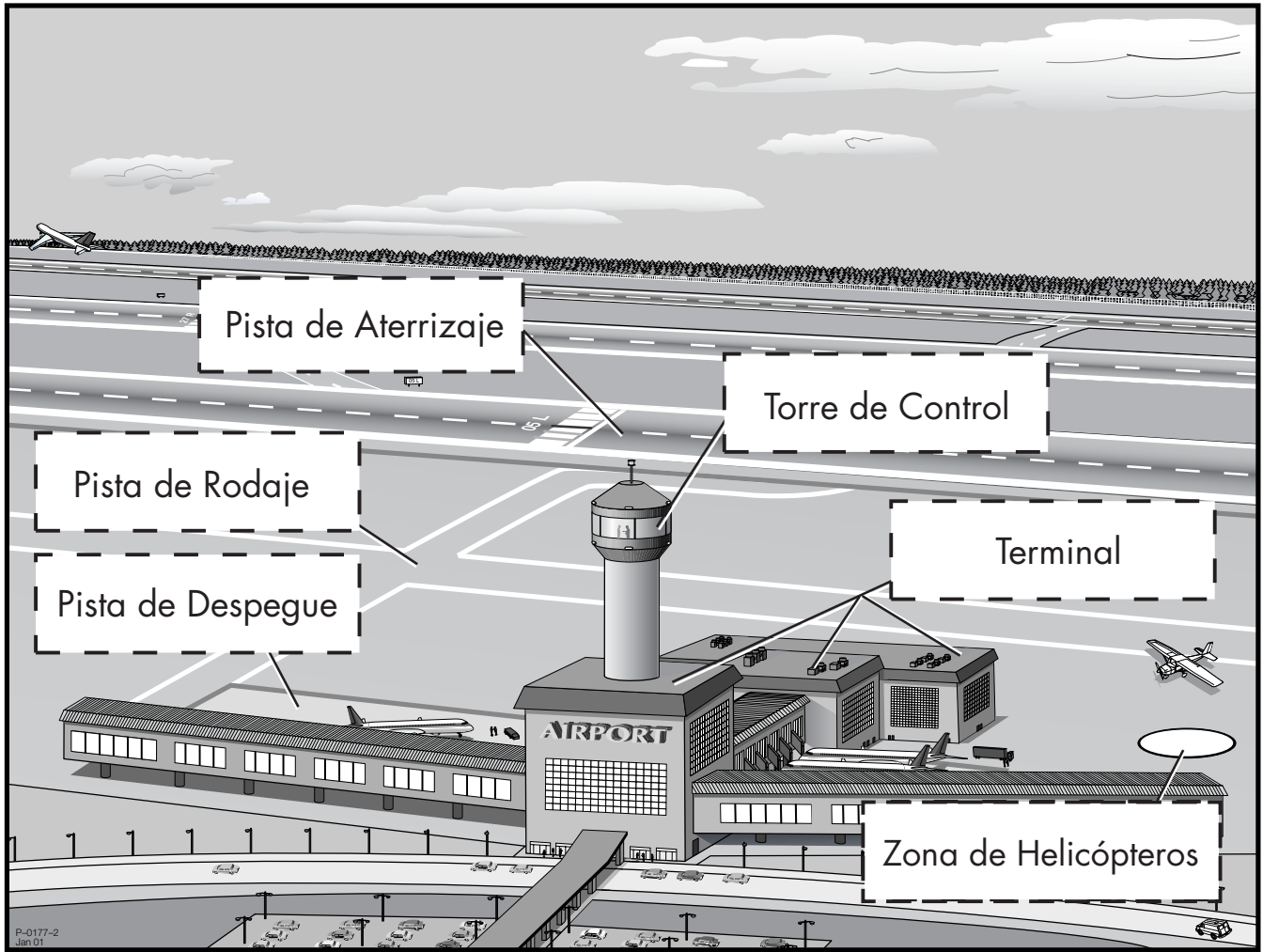
Pista de Despegue

Terminal



Hoja de Respuesta de Etiquetas

Recorte y pegue las partes de un aeropuerto en las casillas de abajo.



Engine Terms

Objectives

The students will

1. Identify different engine styles including rotors, propellers, and jet engines by matching various aircraft to their corresponding engines.
2. Discuss differences in air travel associated with at least three different aircraft types.

Standards

Position and motion of objects

Form and function

Objects in the sky

Properties of objects

Abilities of technological design

Description

The engine terms activity is an additional hands-on activity designed for use with the right-side panel of Johnny's airport adventure storyboard. The three aircraft shown on this panel illustrate basic engine designs that students can identify and label. Cutouts of the matching engines and labels have been supplied for this purpose.

Time Requirements

15 minutes

Materials

Storyboard

Tape or sticky tack

Labels

Commercial plane

Helicopter

Private plane

Cutouts

Jet engine

Rotors

Propellers



Procedure

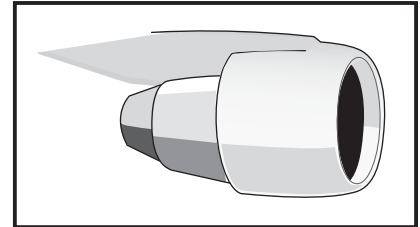
1. Place storyboard in an area easily accessible to students.
2. Have students draw their attention to the right-side panel of the storyboard.
3. Ask students to identify and discuss differences in the three aircraft. The teacher may want to ask, What different uses do these aircraft have? What type of passengers might they carry? Where are their engines located? Do they look the same?



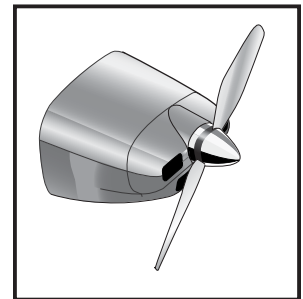
4. Explain the difference between the engines used on commercial planes, private planes, and helicopters (see background information below).
5. Have students match the engine styles to the corresponding aircraft and place them on the storyboard with tape (i.e., jet engine with commercial plane, rotors with helicopter, and propellers with small private plane).
6. Encourage students to think of other types of air travel and how they are powered (i.e., hot air balloons, blimps, and gliders).

Background Information

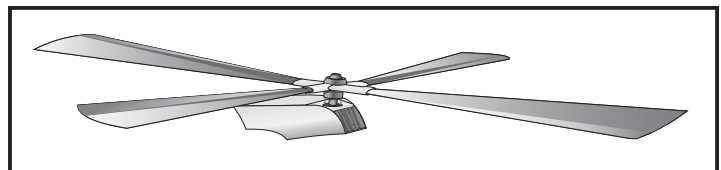
Commercial plane has a large **jet engine** and is used to transport many passengers over long distances. Passengers must buy a ticket to ride on this type of aircraft.



Private plane has a small **propeller-type engine** and is used by individuals to transport themselves or their friends on small trips for business or pleasure.



Helicopter has a horizontally rotating propeller (**rotors**) that lifts the craft upward and forward. This type of craft is used for transporting just a few individuals over short distances. Helicopters can be used for sightseeing trips, life flight trips to hospitals, traffic surveillance, and to land in areas that are inaccessible to airplanes.



FAQ's

Where can I get more information about engine styles?
Visit the Web sites listed at the back of this guide.

Assessment

Students should correctly match the engines to their corresponding aircraft.



Shape Matching

Objective

Students will

1. Demonstrate organization skills by matching the labels and cutouts to the outlines of their corresponding shapes.

Standards

Systems, order, and organization
Geometry

Description

During the shape-matching activity, the students will tape the airport cutouts and labels onto the bottom of the storyboard for easy cleanup and storage.

Time Requirements

5 to 10 minutes

Materials

Storyboard

Cutouts

Labels

Tape or sticky tack

Procedure

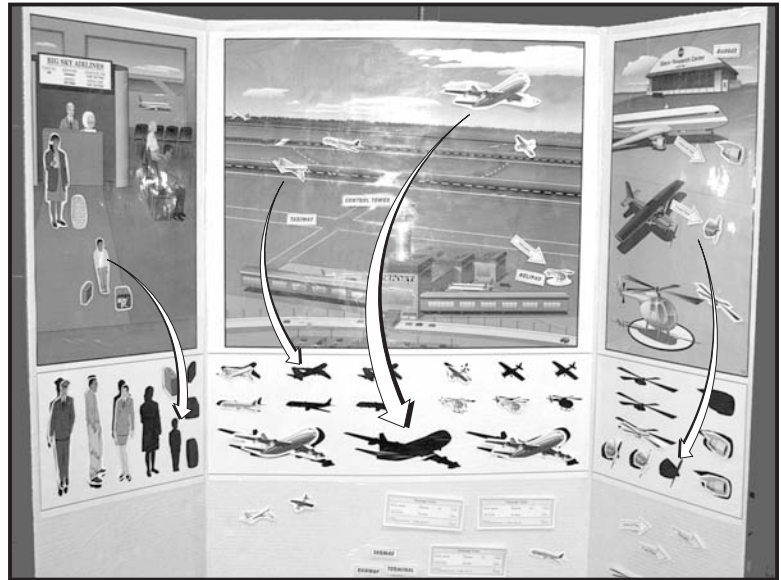
1. Have students tape the labels and cutouts to the bottom of the storyboard matching their silhouettes.

Background Information

This activity is excellent for encouraging students, in a fun way, to clean up by placing objects in their proper place.

Assessment

Students can be evaluated on how well and how quickly they matched up the objects on the storyboard.



Measurement Worksheet

Objectives

Students will

1. Locate Ohio, California, and Florida on a map of the United States.
2. Measure the distance between selected states on a map of the United States using an airplane ruler.
3. Use their imaginations and artistic ability to draw an aircraft of their choice.

Standards

Change, constancy, and measurement

Measurement

Reasoning

Description

The measurement worksheet is an additional activity designed to introduce measurement to young students. The activity requires students to locate and color California, Ohio, and Florida on a map of the United States. The students will then determine the distance between these states using a supplied ruler.

Time Requirements

10 minutes

Materials

Measurement worksheet (pages 27, 28, and 29)

Pencil

Scissors

Crayons

Procedure

1. Have the students cut off the ruler at the bottom of the worksheet before completing questions 4 to 8.
2. The students should then use the airplane ruler to measure the distances between the states on the map printed in the worksheet.

Background Information

The teacher may want to read each question aloud to nonreaders and do the activity as a group. This activity is also a great way to reinforce “color” words to emerging readers.

Assessment

Students should be assessed on how accurately they color the map and answer the questions.



Name _____

Class _____

Measurement Worksheet

1. Find **Ohio** on the map of the United States and color it **blue**.
2. Find **California** on the map of the United States and color it **red**.
3. Cut out the airplane ruler at the bottom of the page.
4. Using the airplane ruler, measure how far it is from Ohio to California.
_____ airplanes
5. Find **Florida** on the map and color it **green**.
6. You and your family are planning to take a trip from Cleveland to Disney World in Florida. Measure how far it is from Ohio to Florida.
_____ airplanes
7. Is Ohio closer to Florida or California? _____
8. Draw a picture of an aircraft you would like to fly on to get there.



Measurement Answer Sheet

1. Find **Ohio** on the map of the United States and color it **blue**.
2. Find **California** on the map of the United States and color it **red**.
3. Cut out the airplane ruler at the bottom of the page.
4. Using the airplane ruler, measure how far it is from Ohio to California.

 6 airplanes

5. Find **Florida** on the map and color it **green**.
6. You and your family are planning to take a trip from Cleveland to Disney World in Florida. Measure how far it is from Ohio to Florida.

 3 airplanes

7. Is Ohio closer to Florida or California? **Florida**

8. Draw a picture of an aircraft you would like to fly on to get there.



Measurement Worksheet

UNITED STATES

Maine
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey
Delaware
Maryland
Virginia
North Carolina
South Carolina
Georgia
Florida *

Vermont
New York
Pennsylvania
Washington DC
West Virginia
Kentucky
Tennessee
Alabama
Mississippi
Louisiana

Ohio *

Michigan
Indiana
Illinois
Missouri
Arkansas

Wisconsin
Iowa
Minnesota
North Dakota
South Dakota
Nebraska
Kansas
Oklahoma
Texas

Montana
Wyoming
Colorado
New Mexico

Washington
Oregon
Idaho
Utah
Arizona
Nevada
California *

Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario

Airplane ruler (cut along dotted line)



Nombre _____

Clase _____

Hoja de Trabajo de Medidas

1. Encuentra **Ohio** en el mapa de los EE.UU. y p ntalo de color **azul**.
2. Encuentra **California** en el mapa de los EE.UU. y p ntalo de color **rojo**.
3. Recorta la regla del avi n que est  al final de la p gina.
4. Usando la regla del avi n, mide lo lejos que es desde Ohio hasta California.
_____? Aviones.
5. Encuentra **Florida** en el mapa y p ntalo de color **verde**.
6.  T  y tu familia est n planeando hacer un viaje desde Cleveland hasta Disney World en la Florida. Mide lo lejos que est  desde Ohio hasta la Florida.
_____? Aviones.
7.  Est  Ohio m s cerca de la Florida o de California? _____
8. Haz un dibujo del avi n en el que te gustar a volar para llegar hasta all .



Hoja de Respuestas de Medidas

1. Encuentra **Ohio** en el mapa de los EE.UU. y píntalo de color **azul**.
2. Encuentra **California** en el mapa de los EE.UU. y píntalo de color **rojo**.
3. Recorta la regla del avión que está al final de la página.
4. Usando la regla del avión, mide lo lejos que es desde Ohio hasta California.
 6 ? Aviones.
5. Encuentra **Florida** en el mapa y píntalo de color **verde**.
6. ¿Tú y tu familia están planeando hacer un viaje desde Cleveland hasta Disney World en la Florida. Mide lo lejos que está desde Ohio hasta la Florida.
 3 ? Aviones.
7. ¿Está Ohio más cerca de la Florida o de California? Florida
8. Haz un dibujo del avión en el que te gustaría volar para llegar hasta allí.



Time Changes Worksheet

Objectives

The students will

1. Recognize changes in time zones relative to air travel.
2. Calculate time changes between eastern standard time and Pacific standard time.

Standards

Change, constancy, and measurement

Problem solving

Measurement

Description

Since Johnny's flight from Cleveland, Ohio, to San Diego, California, involves flying across different time zones, an additional worksheet was created to introduce the idea of time zone changes to the students. Teachers should note, however, that the concept of time changes presented in the worksheet is best suited for students in grades three and four.

Time Requirements

15 minutes

Materials

"Time Changes Worksheet"

Pencils

Map of the United States with time zones indicated

Procedure

1. Read the story "Johnny's Airport Adventure."
2. Point out to the students that the story indicated that Johnny's flight from Cleveland to San Diego took about 4 hours yet the time on the tickets (included in the kit and on the worksheet) shows only a 1-hour difference.
3. Introduce to the students the basic concept of time zones and how there was a time change as Johnny flew across the different time zones in the United States. (Use the map of the United States to point out the different zones.)
4. Hand out the "Time Changes Worksheet" (pages 35 and 36) and the map of the United States indicating the time zones (page 39) for students to complete.

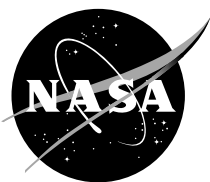


Background Information

The time zones associated with the mainland United States are (from east to west) EST, eastern standard time; CST, central standard time; MST, mountain standard time; and PST, Pacific standard time. Time zones are set at each line of longitude and differ by 1 hour beginning at the prime meridian. The time zones of the eastern United States are ahead of the time zones of the western United States. Therefore, when it is 12 noon in New York City it is 11 a.m. in Chicago, 10 a.m. in Denver, and 9 a.m. in Los Angeles.

Assessment

Students should be evaluated by checking their answers to the answer key.



Name _____

Class _____

Time Changes Worksheet

PASSENGER TICKET				
ISSUED BY	FROM	FLIGHT	DEPARTMENT	
BIG SKY AIRLINE	CLEVELAND	429	11:30AM	
NAME OF PASSENGER	TO	ARRIVAL		
SMITH/JOHNNY	SAN DIEGO	12:30PM		
ENDORSEMENTS			FARE	
BA TC032665RC051370 EX0103 0/ 564509BA 2900CT CLE			\$ 349.62	



How long was Johnny’s flight from Cleveland, Ohio, to San Diego, California? To find out, you will need to answer the following questions using the ticket and watch above.

1. What time did Johnny depart Cleveland? _____
2. What time did Johnny arrive in San Diego? _____
3. What is the time on Johnny’s watch? _____
4. How many hours difference is there between the time on Johnny’s watch and the arrival time in San Diego? _____
5. How many hours difference is there between the departing time and the arrival time on the ticket? _____
6. To find the actual travel time for Johnny’s flight, add the answers to questions four and five together. _____ + _____ = _____ total hours.



Cleveland, Ohio, and San Diego, California, are in different time zones. Notice the letters PST and EST on the ticket. The letters PST stand for Pacific standard time. San Diego, California, is in the PST zone, which is different from the EST zone that Cleveland, Ohio, is in.

7. Can you figure out what the letters EST stand for? Hint: What direction is Cleveland from San Diego? EST = _____

8. How many hours difference is there between EST and PST? Hint: Look at the answer to question 4. _____

9. Is the PST zone behind or ahead of the EST zone? Hint: Compare Johnny's watch to the arrival time on the ticket. _____

10. If it is 8 p.m. in Cleveland, what time is it in San Diego? _____

11. If you wanted to call Johnny in San Diego at 2 p.m. PST from your home in Cleveland, Ohio, what time should you make the call from your house?
_____EST

*Bonus question: Why would a flight from Cleveland to San Diego take more time than the return flight from San Diego to Cleveland?



Time Changes Answer Sheet

PASSENGER TICKET			
ISSUED BY	FROM	FLIGHT	DEPARTMENT
BIG SKY AIRLINE	CLEVELAND	429	11:30AM
NAME OF PASSENGER	TO	ARRIVAL	
SMITH/JOHNNY	SAN DIEGO	12:30PM	
ENDORSEMENTS			FARE
BA TC032665RC051370 EX0103 0/ 564509BA 2900CT CLE			\$ 349.62



How long was Johnny’s flight from Cleveland, Ohio to San Diego, California? To find out, you will need to answer the following questions using the ticket and watch above.

1. What time did Johnny depart Cleveland? **11:30 a.m.**
2. What time did Johnny arrive in San Diego? **12:30 p.m.**
3. What is the time on Johnny’s watch? **3:30**
4. How many hours difference is there between the time on Johnny’s watch and the arrival time in San Diego? **3 hours**
5. How many hours difference is there between the departing time and the arrival time on the ticket? **1 hour**
6. To find the actual travel time for Johnny’s flight, add the answers to questions four and five together. **3** + **1** = **4** total hours.



Cleveland, Ohio, and San Diego, California, are in different time zones. Notice the letters PST and EST on the ticket. The letters PST stand for Pacific standard time. San Diego, California, is in the PST zone, which is different from the EST zone that Cleveland, Ohio, is in.

7. Can you figure out what the letters EST stand for? Hint: What direction is Cleveland from San Diego? EST = **eastern standard time**

8. How many hours difference is there between EST and PST? Hint: Look at the answer to question 4. **3**

9. Is the PST zone behind or ahead of the EST zone? Hint: Compare Johnny's watch to the arrival time on the ticket. **Behind**

10. If it is 8 p.m. in Cleveland, what time is it in San Diego? **5 p.m.**

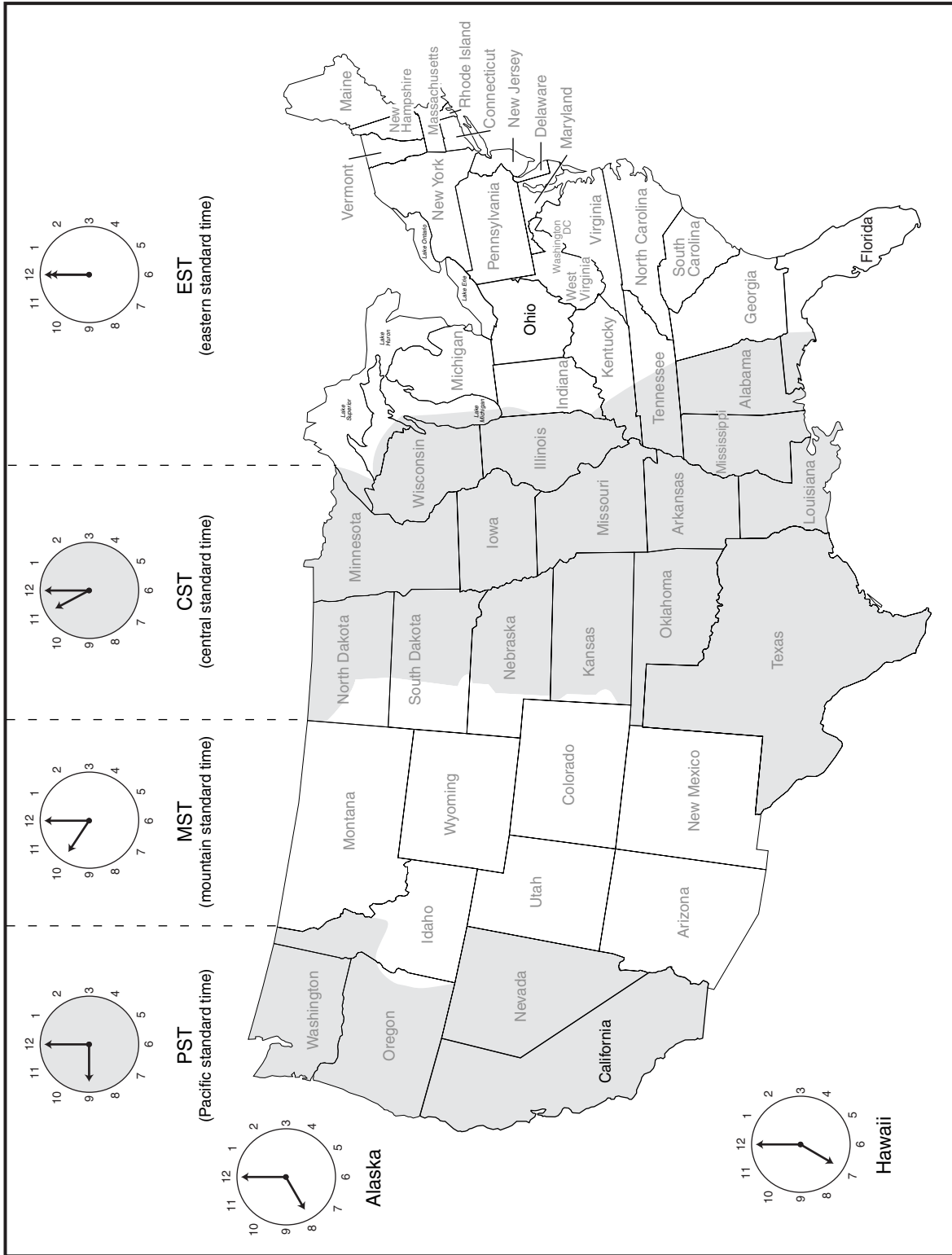
11. If you wanted to call Johnny in San Diego at 2 p.m. PST from your home in Cleveland, Ohio, what time should you make the call from your house?
5 p.m. EST

* Bonus question: Why would a flight from Cleveland to San Diego take more time than the return flight from San Diego to Cleveland?

Flights from east to west encounter greater wind resistance that tends to slow down the aircraft.



Time Changes Worksheet



Nombre _____

Clase _____

Hoja de Trabajo sobre los Cambios de Horas

EI BOLETO del PASAJERO			
Que PUBLICARON POR	DE	EI VUELO	EI DEPARTAMENTO
La LINEA AEREA GRANDE del CIELO	CLEVELAND	429	11:30AM
EI NOMBRE DE PASAJERO	A		La LLEGADA
SMITH/JOHNNY	SAN DIEGO		12:30PM
Los REPALDOS			EI PRECIO DEL BILLETE
BA TC032665RC051370 EX0103 0/ 564509BA 2900CT CLE			\$ 349.62



¿Cuánto tiempo duró el vuelo de Johnny desde Cleveland en Ohio hasta San Diego en California? Con el fin de poder averiguarlo, vas a tener que responder las siguientes preguntas usando el boleto y el reloj que están más abajo.

1. ¿A qué hora partió Johnny desde Cleveland? _____
2. ¿A qué hora arribó Johnny a San Diego? _____
3. ¿Cuál es la hora en el reloj de Johnny? _____
4. ¿Cuántas horas de diferencia hay entre la hora en el reloj de Johnny y la hora de llegada a San Diego? _____
5. ¿Cuántas horas de diferencia hay en el boleto, entre la hora de salida y la hora de llegada? _____
6. Para saber la hora real del vuelo de Johnny, suma las respuestas de las preguntas cuatro y cinco. _____ + _____ = _____ horas en total.



Cleveland, Ohio y San Diego en California están en diferentes zonas horarias. Observa las letras PST y EST en el boleto. Las letras PST significan la hora del Pacífico en EE.UU. (Pacific standard time). San Diego en California está en la zona PST, la que es diferente a la zona EST en donde está Cleveland Ohio.

7. ¿Puedes averiguar qué significa la sigla EST? Adivina: ¿En qué dirección está Cleveland desde San Diego?

EST = _____

8. ¿Cuántas hora de diferencia existen entre EST y PST? Adivina: mira la respuesta de la pregunta número 4.) _____

9. ¿Está la zona PST antes o después de la zona EST? Adivina: compara el reloj de Johnny con la hora de llegada que indica el boleto. _____

10. Si son las 8 p.m. en Cleveland, ¿qué hora es entonces en San Diego? _____

11. Si quisieras llamar a Johnny a San Diego a las 2 p.m. (PST) desde tu casa en Cleveland Ohio, ¿a qué hora deberías hacer la llamada desde tu casa?
_____ EST

* Pregunta de Bonificación para Pensar: ¿por qué un vuelo desde Cleveland hasta San Diego toma más tiempo que el vuelo de regreso desde San Diego hasta Cleveland?



Hoja de Respuestas sobre los Cambios de Horas

EI BOLETO del PASAJERO			
Que PUBLICARON POR	DE	EI VUELO	EI DEPARTAMENTO
La LINEA AEREA GRANDE del CIELO	CLEVELAND	429	11:30AM
EI NOMBRE DE PASAJERO	A		La LLEGADA
SMITH/JOHNNY	SAN DIEGO		12:30PM
Los REPALDOS			EI PRECIO DEL BILLETE
BA TC032665RC051370 EX0103 0/ 564509BA 2900CT CLE			\$ 349.62



¿Cuánto tiempo duró el vuelo de Johnny desde Cleveland en Ohio hasta San Diego en California? Con el fin de poder averiguarlo, vas a tener que responder las siguientes preguntas usando el boleto y el reloj que están más abajo.

1. ¿A qué hora partió Johnny desde Cleveland? **11:30 a.m.**
2. ¿A qué hora arribó Johnny a San Diego? **12:30 p.m.**
3. ¿Cuál es la hora en el reloj de Johnny? **3:30**
4. ¿Cuántas horas de diferencia hay entre la hora en el reloj de Johnny y la hora de llegada a San Diego? **3 horas**
5. ¿Cuántas horas de diferencia hay en el boleto, entre la hora de salida y la hora de llegada? **1 horas**
6. Para saber la hora real del vuelo de Johnny, suma las respuestas de las preguntas cuatro y cinco. **3** + **1** = **4** horas en total.



Cleveland, Ohio y San Diego en California están en diferentes zonas horarias. Observa las letras PST y EST en el boleto. Las letras PST significan la hora del Pacífico en EE.UU. (Pacific standard time). San Diego en California está en la zona PST, la que es diferente a la zona EST en donde está Cleveland Ohio.

7. ¿Puedes averiguar qué significa la sigla EST? Adivina: ¿En qué dirección está Cleveland desde San Diego?

EST = **Hora del Este en los EE.UU. (eastern standard time)**

8. ¿Cuántas hora de diferencia existen entre EST y PST? Adivina: mira la respuesta de la pregunta número 4. **3**

9. ¿Está la zona PST antes o después de la zona EST? Adivina: compara el reloj de Johnny con la hora de llegada que indica el boleto. **Después**

10. Si son las 8 p.m. en Cleveland, ¿qué hora es entonces en San Diego? **5 p.m.**

11. Si quisieras llamar a Johnny a San Diego a las 2 p.m. (PST) desde tu casa en Cleveland Ohio, ¿a qué hora deberías hacer la llamada desde tu casa?
5 p.m. EST

* Pregunta de Bonificación para Pensar: ¿por qué un vuelo desde Cleveland hast San Diego toma más tiempo que el vuelo de regreso desde San Diego hasta Cleveland?

Los vuelos desde el Este al Oeste se encuentran con fuertes vientos en contra, los que tienden a disminuir la velocidad de los aviones.



Web Site Page

For more information about aeronautics and related education materials, visit the Web sites below.

NASA Education Materials and Programs

<http://spacelink.nasa.gov>

<http://education.nasa.gov>

NASA's Ultra-Efficient Engine Technology Kid's Page

<http://www.ueet.nasa.gov/StudentSite/>

The K-8 Aeronautics Internet Textbook

<http://wings.avkids.com>

<http://wings.avkids.com/Tours/Engine/>

Robin Whirlybird on Her Rotorcraft Adventures

<http://rotored.arc.nasa.gov/index.html>

How Things Fly

<http://www.aero.hq.nasa.gov/edu/index.html>

NASA Glenn Learning Technologies Program

<http://www.grc.nasa.gov/WWW/K-12/>

NASA Explores

<http://NASAexplores.com/cgi-bin/index.pl>



NASA Educator Resource Centers

NASA's Central Operation of Resources for Educators (CORE) was established for the national distribution of NASA-produced educational materials in audiovisual format. Educators may obtain a catalogue and an order form by one of the following methods:

NASA CORE—Lorain County Joint Vocational School
 15181 Route 58 South
 Oberlin, OH 44074
 Phone: 440-775-1400
 FAX: 440-775-1460
 E-mail: nasaco@leeca.org
 Web page: <http://core.nasa.gov>

Educator Resource Center Network (ERCN)

To make additional information available to the education community, NASA has created the ERCN. Educators may preview, copy, or receive NASA materials at these sites. Phone calls are welcome if you are unable to visit the area. A list of the centers and the regions they serve follows.

If you live in	Please contact
Alaska Arizona California Hawaii Idaho Montana Nevada Oregon Utah Washington Wyoming	<p>Address: NASA Ames Research Center Educator Resource Center, Mail Stop 253-2 Moffett Field, CA 94035-1000</p> <p>Phone: 650-604-3574</p> <p>Fax: 650-604-3445</p> <p>Web page: http://amesnews.arc.nasa.gov/ererchome.html</p>



If you live in	Please contact
Alabama Arkansas Louisiana Missouri Tennessee Iowa	<p>Address: U.S. Space and Rocket Center NASA Marshall Space Flight Center Educator Resource Center One Tranquility Base Huntsville, AL 35758</p> <p>Phone: 256-544-5812</p> <p>Fax: 256-544-5820</p> <p>Web page: http://www.msfc.nasa.gov/education/erc</p>
Mississippi	<p>Address: NASA Stennis Space Center Educator Resource Center Building 1100, Room 209F Stennis Space Center, MS 39529-6000</p> <p>Phone: 228-688-3653</p> <p>Fax: 228-688-7499</p> <p>Web page: http://education.ssc.nasa.gov</p>
Connecticut Delaware District of Columbia Maine Maryland Massachusetts Pennsylvania New Hampshire New Jersey New York Rhode Island Vermont	<p>Address: NASA Goddard Space Flight Center Educator Resource Center, Mail Code 130.3 Greenbelt, MD 20771</p> <p>Phone: 301-286-8570</p> <p>Fax: 301-286-1781</p> <p>Web page: http://pao.gsfc.nasa.gov/gsfcc/educ/trl/welcome.html</p>



If you live in	Please contact
Florida Georgia Puerto Rico Virgin Islands	Address: NASA Kennedy Space Center Educators Resource Center, Mail Code ERC J.F. Kennedy Space Center, FL 32899 Phone: 321-867-2959 Fax: 321-867-7242 Web page: http://www.ksc.nasa.gov
Kentucky North Carolina South Carolina Virginia West Virginia	Address: Educator Resource Center for NASA Langley Research Center Virginia Air and Space Center 600 Settlers Landing Road Hampton, VA 23669-4033 Phone: 757-727-0900 Ext. 757 Fax: 757-727-0898 Web page: http://www.vasc.org/erc
Illinois Indiana Michigan Minnesota Ohio Wisconsin	Address: NASA Glenn Research Center at Lewis Field Educator Resource Center 21000 Brookpark Road, Mail Stop 8-1 Cleveland, OH 44135 Phone: 216-433-2017 Fax: 216-433-3601 Web page: http://www.grc.nasa.gov/WWW/OEP/
Colorado Kansas Nebraska New Mexico North Dakota Oklahoma South Dakota Texas	Address: Educator Resource Center for NASA Johnson Space Center Houston 1601 NASA Road One Houston, TX 77058 Phone: 281-244-2129 Fax: 281-483-9638 Web page: http://spacecenter.org/educator_resource.html



Glossary

Air traffic controller	Person working to monitor and direct the flight routes of aircraft
Cockpit	A compartment in an airplane for the pilot and copilot
Control tower	A structure in an airfield from which aircraft traffic is directed
Hangar	A shed for housing airplanes
Helipad	A landing space for helicopters
Jet engine	An engine that takes in outside air to burn fuel to create energy that is expelled as heated gas to the rear under high pressure
Landing gear	The wheels of an airplane
NASA	National Aeronautics and Space Administration
Propellers	A device for moving a craft through the air by the use of blades mounted on a shaft that produce a thrust when rotated
Rotors	The horizontally rotating unit of a helicopter
Runway	A roadlike surface used for the takeoff and landing of aircraft
Tarmac	The asphalt roads or runways at an airport
Taxiway	Roadway used by airplanes leading to and from the runway
Terminal	Building or location where passengers await the arrival and departure of aircraft

Johnny's Airport Adventure

An Inquiry-Based Technology Educator Guide

EDUCATOR REPLY CARD

To achieve America's goals in educational excellence, it is NASA's mission to develop supplementary instructional materials and curricula in science, mathematics, and technology. NASA seeks to involve the educational community in the development and improvement of these materials. Your evaluation and suggestions are vital to continually improving NASA educational materials.

Please take a moment to respond to the statements and questions below. You can submit your response through the Internet or by mail. Send your reply to the following Internet address:

http://ehb2.gsfc.nasa.gov/edcats/centers/johnnys_adv_reply_card.html

You will then be asked to enter your data at the appropriate prompt.

Otherwise, please return the reply card by mail. Thank you.

- With what grades did you use the educator guide?
Number of teachers/faculty: _____

_____ K-4	_____ 5-8	_____ 9-12	_____ Community college
_____ College/university	_____ Undergraduate	_____ Graduate	

 Number of students: _____

_____ K-4	_____ 5-8	_____ 9-12	_____ Community college
_____ College/university	_____ Undergraduate	_____ Graduate	

 Number of others: _____

_____ Administrators/staff	_____ Parents	_____ Professional groups
_____ General public	_____ Civic groups	_____ Other
- What is your home five- or nine-digit zip code? _____
- Is this a valuable activity?
 Strongly agree Agree Neutral Disagree Strongly disagree
- How well did the activity help you meet the standards?
 Excellent Good Average Poor Very poor

Fold along line and tape closed.

- How did you use this educators guide?
(Mark all that apply.)

- | | |
|--|--|
| <input type="checkbox"/> Background information | <input type="checkbox"/> Critical thinking tasks |
| <input type="checkbox"/> Demonstrate NASA materials | <input type="checkbox"/> Demonstration |
| <input type="checkbox"/> Group discussions | <input type="checkbox"/> Hands-on activities |
| <input type="checkbox"/> Integration into existing curricula | <input type="checkbox"/> Interdisciplinary activity |
| <input type="checkbox"/> Lecture | <input type="checkbox"/> Science and mathematics standards integration |
| <input type="checkbox"/> Team activity | |
| <input type="checkbox"/> Other Please specify: _____ | |

- How did you learn about this activity?
(Mark all that apply.)

- NASA Educator Resource Center
- NASA Central Operation of Resources for Educators (CORE)
- Institution/school system
- Fellow educator
- Workshop/conference
- Other Please specify: _____

- What did you like best about this activity? _____

- How would you modify this activity? _____

- Additional comments: _____

- Last name: _____

First name: _____
 E-mail address: _____

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 Street address 2: _____
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 City: _____
 State: _____
 Zip code: _____
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