



Civil Air Patrol's

"Plane Art"

For Use with CAP Balsa Planes & **Primary Students**
by AAS/SW Joint National Project: **STEM Outreach**



Partners in Aerospace and STEM Education:



Arnold Air Society



Civil Air Patrol



United States Air Force



Air Force Association



Silver Wings

Lesson Topic: airplanes, vocabulary (science, language arts)

Length of Lesson: 45 minutes, or as long as is desired, using as much or as little of this lesson as needed

Objectives:

- Students will identify 4 parts of a plane: cockpit, wings, fuselage, and tail.
- Students will define cockpit, wings, fuselage, and tail.
- Students will practice flying their plane.

National Science Standards:

- Content Standard A: Science as Inquiry
- Content Standard B: Physical Science
 - Properties of objects and materials
 - Position and motion of objects
- Content Standard D: Earth and Space Science
 - Objects in the sky
- Content Standard E: Science and Technology
 - Abilities of technological design



Background Information:

This lesson seeks to introduce basic facts regarding 4 basic parts of a plane: cockpit, wings, fuselage, and tail. Additionally, students will be able to practice flying their airplane, discovering how the force with which they toss the plane and the angle at which they release the plane effects flight performance.

Materials:

- balsa planes (provided by CAP)
- ink pen
- chalkboard (dry erase board/marker)
- water color paint, markers, or stickers (optional)

NOTE: Use the balsa planes that CAP sent to you for use with this lesson. This activity is a great activity to use water color paint! It works great on the balsa planes, and kids love the opportunity to paint! But, washable markers are also good, as are stickers. **Important to stress being gentle with the balsa planes as they are made of thin wood and will easily break.** *Two planes per student have been included, just in case of breakage.*

Lesson Presentation:

1. Begin by casually flying a balsa plane in the class with as little attention given to the students as possible. Ask a student to please catch the plane for you. Speak your thoughts while tossing the plane, such as, "I wonder what will happen if I point my airplane up a bit more and toss it," "Maybe if I toss it as hard as I can, it will fly farther," or "I wonder what will happen if I remove the tail parts of the plane." After a few tosses and thinking aloud, ask the students if they would like to build a plane like yours and practice flying it.
2. Tell students that they must agree not to test their plane until you have given them directions to do so. Tell them that after their plane is built, you have a few things to tell them before they fly their plane.
3. Distribute one balsa plane to each student. Help them assemble their plane, stressing the importance of working gently to assemble the plane.
4. Draw an outline of an airplane on the board. Draw arrows to the 4 parts of the plane you are about to discuss (wings, tail, fuselage, and cockpit).
5. Tell students that before they fly their plane, you want them to learn some parts of the plane. Point to the wings. Ask students if they know what this part of the plane is. Confirm those are the wings. Write "wings" next to the arrow pointing to the wings on the picture on the board. Ask students if they can explain why it is important for a plane to have wings. Explain that when air flows over the wings of the plane, it helps the plane stay lifted in the air. There is a push upward below the wings and a pull above the wings. The wings help the plane sail through the air.
6. Ask the students what we call the end of the plane. Confirm that we call it the tail. Write "tail" next to the arrow pointing to the tail of the airplane on the board. Ask students what they think the tail does. Confirm that it helps the plane stay in control and fly straight through the air. (It helps stabilize and balance the plane.) (If using the CAP balsa airplanes, tell students that there are two pieces that make up the tail area of their airplane; the piece in the back that fits on top of the fuselage, and the other piece that is inserted horizontally.)

7. Ask students what the long part of the plane is; the part that goes through the wings and seems to end with the tail. Tell students that this part is called the fuselage. Have students pronounce the name with you: few - suh - lodge. Write "fuselage" next to the arrow pointing to the fuselage of the airplane on the board. Ask students if they know what the fuselage is. Explain that it is just the body of the plane. Everything is connected to the fuselage, and luggage and people fit inside the fuselage.
8. Ask students to point to the place where the pilots would sit. Confirm that the pilots sit toward the front of the plane in the fuselage. Ask students what we call the front of the fuselage where the pilot sits. Confirm that we call this the cockpit. Write "cockpit" next to the arrow pointing to the cockpit of the airplane on the board.
9. Check for understanding by calling out the 4 parts of the plane and observing that students point to the correct part of the plane.
10. Ask students to write their name on either the tail or the fuselage with an ink pen. (Or, the adult may want to write the names to avoid the potential of breakage.) Tell students to only use white or yellow if they color or paint over their name.
11. Allow students to decorate their plane using markers, water color paint, or stickers.
12. Ask students to try different things when flying their plane to see what helps their plane fly the best. Does it work better if they toss their plane hard or softly? Does it fly better if they toss it straight or angle it up or down? What happens if the wings or parts of the tail are removed?
13. Once students have had a few minutes to practice flying their airplane, call everyone together to share what they thought worked well or what did not.

Summarization:

Ask students to share what they learned. (Make sure that all of the parts of the plane and function of the parts are mentioned.)

Character Connection: Express to students that just as they colored their airplane to make it look nice, they have the opportunity each day to color their home and school by their attitudes. Being nice, sharing, helping, smiling, and putting forth one's best effort are the best decorations to make the world a beautiful place.

Drug Demand Reduction (DDR) Connection: Ask students what a real plane needs to fly. Point out that one thing a plane needs to fly is fuel. Just like people take a car to a gas station to get gas, a plane also has to have gas to give it energy so its engine(s) will work. Ask students what kind of fuel they put in their bodies to keep it going. Tell students that if they put the wrong "fuel" inside them, their bodies will not work as well. Too much candy and too many soft drinks can be bad. Additionally, if they put things that do not belong in their bodies, such as cigarette smoke or someone else's medicine, those things

can harm their bodies and cause damage. Remind students to never take candy from strangers, stay away from cigarette smoke if at all possible, and never take someone else's medicine. Putting the right stuff in our bodies will help keep us "flying" for a long time.

Assessment:

- leader observation
- "Airplane Art Parts" (optional extension worksheet, attached)
Answers: 1. Tail 2. Wings 3. Cockpit 4. fuselage

Additional activity ideas to enrich and extend the primary lesson (optional):

- Have an airplane flying contest to see whose airplane stays in the air the longest or whose airplane flies the farthest.
- Complete the next lesson: "Plane Flight Pie Chart"

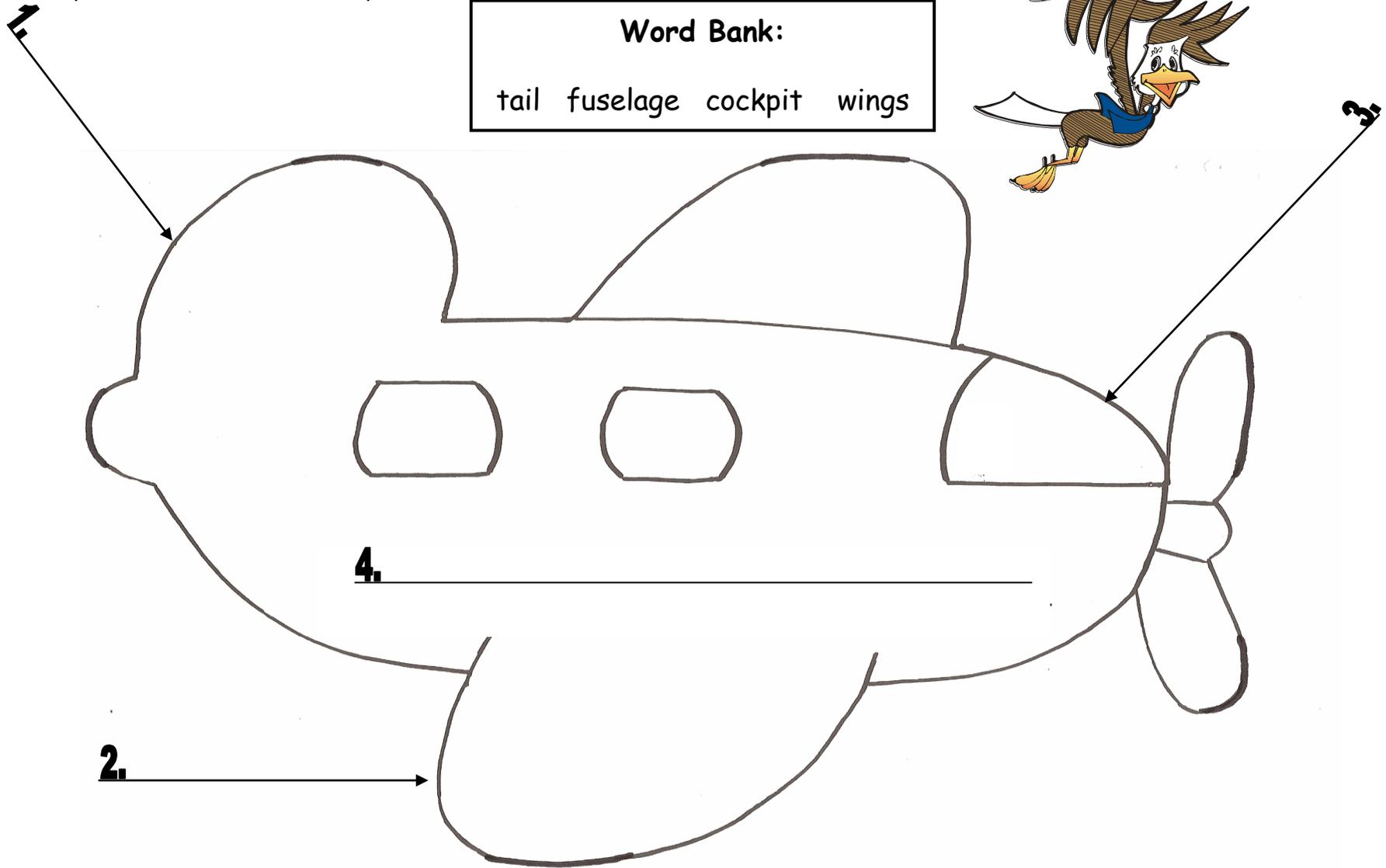
Airplane Art Parts

NAME _____

the plane, and then color the plane.

Directions: Use the word bank to label the parts of

Word Bank:
tail fuselage cockpit wings



airplane outline from:

<http://www.kellykindergarten.com/Monthly%20Centers/March/downloads/AirplaneClozeSentences.doc>



Civil Air Patrol's

"Plane Flight Pie Chart"

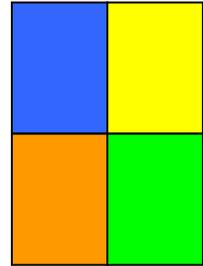
For Additional Use with CAP Balsa Planes
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Lesson Topics: motion, counting, graphs (science, math)

Length of Lesson: 45 minutes, or as long as desired, using as much or as little of this additional lesson as is needed



Objectives:

- Students will practice flying their plane at a target.
- Students will define the term data.
- Students will record information.
- Students will create a pie graph using their information.

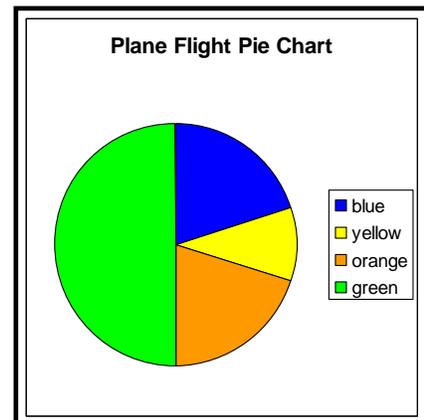
National Standards:

Science

- Content Standard A: Science as Inquiry
- Content Standard B: Physical Science
 - Properties of objects and materials
 - Position and motion of objects
- Content Standard E: Science and Technology
 - Abilities of technological design

Math

- Number and Operations: Understand and represent commonly used fractions, such as $1/4$, $1/3$, and $1/2$
- Data Analysis and Probability Standard
 - Represent data using concrete objects, pictures, and graphs
 - Describe parts of the data and the set of data as a whole to determine what the data show
- Representation: Create and use representations to organize, record, and communicate mathematical ideas
- Connections: Recognize and apply mathematics in contexts outside of mathematics



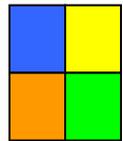
Background Information:

No background information is necessary for this lesson; however, please see the "NOTE" that follows the list of materials to learn how to make the targets.

Materials:

- balsa planes (provided by CAP)
- colored pieces of construction paper
- "Plane Flight Pie Chart" copies
- dry erase board (or chalkboard) and 4 different colored markers (or chalk)
- tape
- crayons

NOTE: To assemble a target, join 4 different colored pieces of construction paper together using tape. Have enough target areas set up in the classroom prior to beginning the lesson. Consider making large targets by using butcher paper, or attach multiple pieces of construction paper to make a larger target. Also, set up "flight" lines by placing a piece of masking tape on the ground several feet in front of each target. This will let students know where to stand to toss their airplane.



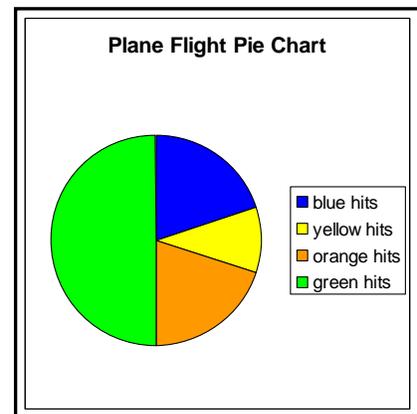
Lesson Presentation:

1. Distribute CAP balsa airplanes to students. If students have not completed "Plane Art," have students carefully assemble the balsa planes. **Important to stress being gentle with the balsa planes as they are made of thin wood and will easily break.** *Two planes per student have been included, just in case of breakage.* Make sure student name is written on each airplane.
2. Tell students that they will practice their flight skills today by tossing their airplane toward a target. Show students the target(s) in the classroom. Tell students that they will stand behind the "flight" line and toss their airplane toward the target.
3. Divide students into groups of 4 members per group and assign a target to each group. Allow each person to practice tossing his/her airplane toward the target.
4. Once all students have had the opportunity to practice a few times, ask all students to return to their desks.
5. Explain to the students that they will be recording information about their flights. Tells students that another word for information is data. Scientists collect data and often show their data (information) to others in the form of charts and graphs. Tell students that they will make a pie chart to show information about the data they collect from their flights today.
6. Distribute the "Plane Flight Pie Chart" data sheet to each student, and ask them to write their name on their paper. Explain that they will toss their airplane toward the target for a total of 10 times. After each toss, they must go to their data sheet and indicate what color their plane hit on the target by coloring the box on

their data sheet the same color that their plane hit on the target. If their plane does not actually make contact with a color on the target, students should select the color on the target that their plane came closest to hitting. Demonstrate the instructions for the students.

Tell students that after they have tossed their plane 10 times and have 10 colored boxes on their data sheet, they should return to their seats and wait for the next set of instructions. Tell them that because they are in groups, group members can be good teammates by retrieving the planes, waiting patiently, helping others with their data sheet, etc.

7. Ask students to take their data sheet, crayons, and plane to their assigned target area and begin tossing their airplanes and recording their data in the boxes on their data sheet.
8. Once all students have finished and are seated at their desks, ask them to count the number of blue boxes they have. Then, ask them to color that many slices of pie on their data sheet, making sure that they color pie slices that are directly next to each other. For example, if a student's plane hit the blue target only 2 times, the student could not color the top pie slice blue and the bottom pie slice blue. The two blue pie slices must be side by side. Demonstrate this on the board.
9. Repeat step #8 for the three other colors.
10. Explain to students that they, just like a scientist, collected information and now have created a visual picture of their data (information). This visual picture that they have created is called a pie chart! A pie chart is a visual picture that shows us information.
11. Draw a circle on the board. Using 4 colors, fill in the circle similar to the one on the right. Ask students how many times the plane hit each color if a plane was tossed a total of 10 times. Explain that when half of a pie chart's circle is one color, it represents "half." So, if a plane was tossed 10 times, the plane hit that particular color 5 times. Based on this information, see if students can determine the specific numbers for the other 3 colors which appear on the right side of the circle. Ask students to notice how two colors take up the same amount of space, meaning the number of hits for both of these colors will be the same. (In the example on the right, blue and orange represent 2 and yellow represents 1.)



Summarization:

Ask students to share what they learned. Ask them to define data and pie chart.

Character Connection: In order to stay on target in life, we must know where it is we want or need to go and do our very best to get there. For example, if we want to make it to second-grade, we must aim to get there by following directions, doing our homework, asking questions when we do not understand something, and doing our best while in first-grade. Always think about where it is you are trying to go and make good choices to help you get there! Making good choices will help keep you flying in the right direction!

Assessment:

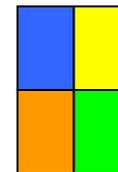
- leader observation
- completed "Plane Flight Pie Chart" data sheets

Additional activity ideas to enrich and extend the primary lesson (optional):

- Have students make a bar graph using their flight data.
- On the board, list each of the 4 colors that were used to make the targets in the classroom. Poll the students to see which color they hit the most. For example, ask how many students hit yellow the most, and record the number of students whose plane hit the blue target the most next to "blue" on the board. Once the information has been collected, have students construct a bar graph to reflect the information. Another idea is to prepare a circle graph that shows the same amount of pie slices on the graph as the number of students in the class and complete this lesson extension activity. Hang the class bar graph or pie chart in the room as a reminder of this activity!
- Allow students to look at 3 other students' pie charts. Have them write each student's name on a piece of paper and write down the number of times the student's airplane hit each color of the target by looking at the pie chart.
- Help students make graphs and charts using the computer. Consider using <http://nces.ed.gov/nceskids/createagraph/default.aspx> to create graphs.

Name _____

Plane Flight Pie Chart



1. Toss your plane toward a target.
2. Color the first box below the same color as the color that your airplane hit. If your airplane did not hit a color, use the color that it came closest to hitting.
3. Toss your plane 9 more times so that each of the 10 boxes below will have a color.

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Wait for your teacher's instructions before starting step #4.

4. Pick one colored square above. Count how many squares there are of that color. Color the same number of pie slices that color. Make sure the pie slices you color are next to each other! Don't skip pie slices when coloring!
5. Follow the directions in step #4 for the other colored boxes.

