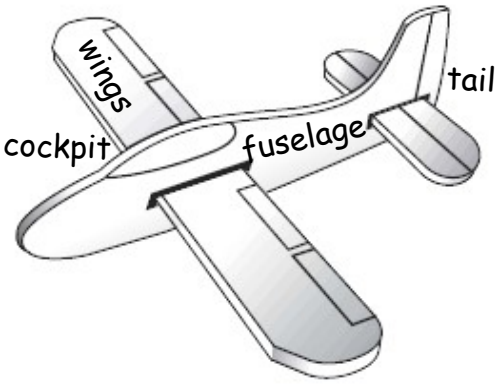
Civil Air Patrol's ACE Program

Plane Art
Grade 1 Academic Lesson #3

Topic: gliders, vocabulary (science, language arts)

Length of Lesson: 45 minutes



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 balsa glider.

Next Generation Science Standards:

- The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

National Core Arts Standards:

- #2 - Students will organize and develop artistic ideas and work.

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 glider, discovering how the force with which they toss the glider and the angle at which they release the plane affects flight performance.

Building and flying balsa airplane models is an excellent way to learn about airplane construction and flight. Balsa models are not just toys: engineers also create models of their designs before building the real, full-sized craft or product. Building models was an early method used by the pioneers of aviation. Early designers did not just begin by building flying machines and racing about in them—that would have been far too dangerous. These early inventors and engineers — such as the Wright Brothers — began with building model kites and gliders to learn about flight patterns. At a smaller scale, they played with wing shapes and sizes to see how much kites and gliders could carry. They once created a model kite that could carry a 10-year-old boy!

What is the difference between a glider and an airplane? (Listen to student ideas.) A glider is any aircraft that flies without an engine. Gliders can have all the same parts as an airplane, but use the wind — instead of fuel — for power. How many of you have ever made a glider out of balsa wood? (If possible, show an example of the models they will be making or show them what the balsa wood looks and feels like.) What makes balsa a good material for glider model design? (Possible answers: it is very light, easy to cut and alter; and inexpensive.)

Materials:

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

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 nicely on the balsa planes, and kids love the opportunity to paint.

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, act like you just realized that your students are all watching you. 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 permission 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.

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 that the correct answer is 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 write their name on either the tail or the fuselage with an ink pen. Tell students to only use white or yellow paint or markers if they color over their name.

9. Use this short video "Let's Build a Plane" to review the parts of the parts of the airplane.

10. Allow students to decorate their plane using markers or water color paint.

11. 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?

12. Once students have had a few minutes to practice flying their airplane, call everyone together to allow students to share what they thought worked well or what did not.

Summarization:
Ask students to share what they learned today. (Make sure that all of the parts of the plane and function of the parts are mentioned.) Question prompts: why did your plane perform the way it did? Why did the best plane fly so well? What would you do differently if you made another plane? What could you add to your plane to improve it?

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 classroom by their attitudes. Being nice, sharing, helping, smiling, and putting forth one's best effort are the best decorations in the classroom. Those things make the class, as well as the world a beautiful place.

Assessment:

- teacher observation
- "Airplane Art Parts" (optional extension worksheet)

Drug Demand Reduction (DDR) Connection: See page 9.

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

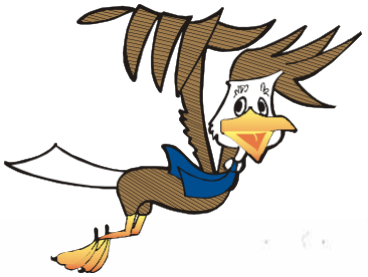
- Have an airplane flying contest to see whose airplane stays in the air the longest or whose airplane flies the farthest.
- Complete the "Airplane Art Parts" worksheet.
  Answers: 1. tail 2. wings 3. cockpit 4. fuselage

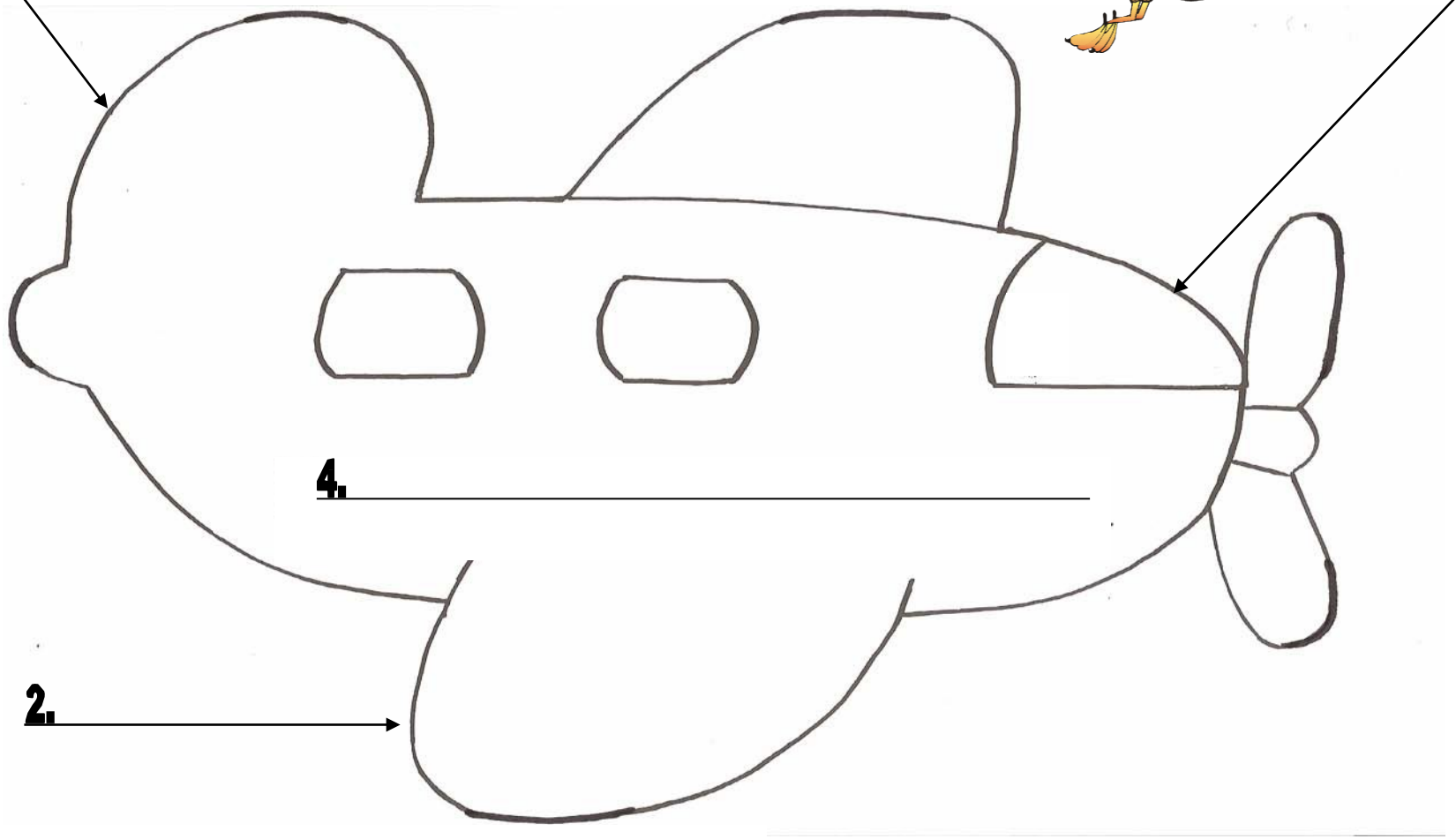
Airplane Art Parts

NAME _____ Directions: Use the word bank to label the parts of the plane, and then color the plane.

Word Bank:

tail fuselage cockpit wings

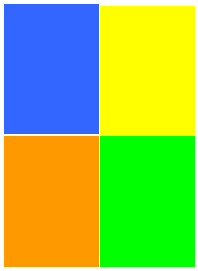




airplane outline from: Kelly's Kindergarten

Civil Air Patrol's ACE Program

Plane Flight Pie Chart
Grade 1 Academic Lesson #4



Topics: motion, counting, graphs (science, math)

Length of Lesson: 45 minutes

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 or bar graph using their information.

Next Generation Science Standards:

- Plan and conduct investigations collaboratively to produce data as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3)
- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2)

CCSS Math:

- 1.MD.4. - Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
- 1.G.3 - Partition circles and rectangles into two and four equal shares; describe the shares using the words *halves, fourths, and quarters*; and use the phrases *half of, fourth of, and quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

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 academic lesson #3, "Plane Art," have students carefully assemble the balsa planes. Make sure students have their name written on their 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. Tell 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.

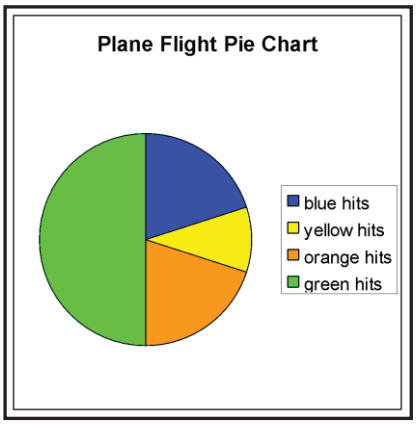
   Tell students that after they have tossed their plane 10 times and have 10 colored boxes on their data sheet, they should return to their seats and wait for the next set of instructions. Tell them that because they are in groups, group members can be good teammates by retrieving the planes, waiting patiently,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

Drug Demand Reduction (DDR) Connection: See page 9.

Assessment:
- teacher observation
- completed "Plane Flight Pie Chart" or "Plane Flight Bar Graph" data sheets

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

- Have students make a bar graph using their flight data instead of a pie chart (data sheet included).

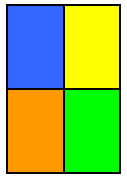
- On the board, list each of the 4 colors that were used to make the targets in the classroom. Poll the students to see which color they hit the most. For example, ask how many students hit yellow the most, and record the number of students whose plane hit the yellow target the most next to "yellow" 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.

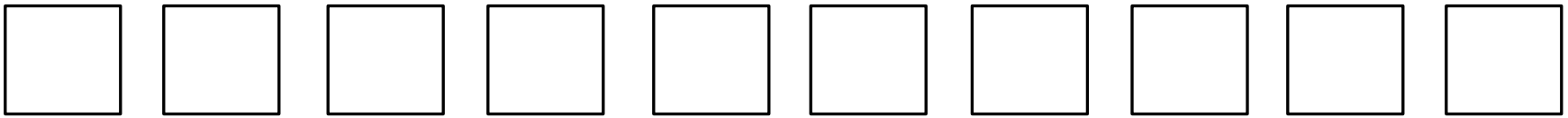
- Help students make graphs and charts using the computer. Consider using NCES Kids' Zone: Create a Graph .

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.



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.