

I FLY
ACTIVITY & EDUCATOR GUIDE

Table of Contents

Grades K-2+ Activities

Experiment: What Makes an Airplane Move? 1
Creative Prompt: Where would you fly an Airplane?..... 3
Who Helps an Airplane Fly? 4
I Fly Reading Comprehension Worksheet 5
I Fly Addition Math Worksheet 6
I Fly Word Work..... 8
Story Sequence Worksheet..... 9

Grades 3-5 Activities

Experiment: Paper Airplane Design Test 10
Experiment: Why do Airplane Rides Sometimes feel Bumpy?..... 12
Air Traffic Communication Challenge 14
Creative Prompt: Where in the World Will it Go? 16
Airplane Word Problem Math Worksheet 18
Coloring Pages 20-21

This guide was created by Grace Nowatzke and Kelly Rice Schnitt
© 2026 Lerner Publishing Group, Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

Lerner

EXPERIMENT: WHAT MAKES AN AIRPLANE MOVE?

"Lights on, throttle set—let's jet! My engines roar, thrusting me forward."

In order for an airplane to fly, several forces act on it at the same time. In this activity, students will explore how changing the amount of force changes an object's motion.

SUPPLIES EACH GROUP WILL NEED

- Access to a scale
- Open space for testing
- Masking tape to mark a starting line
- Paper, pencil, and ruler to record observations
- A number of objects to test

Example objects:

- Paper cups
- Empty toilet paper rolls
- Empty soda cans
- Toy cars
- Marbles
- Pencils
- Erasers
- Small blocks

DIRECTIONS

1. Place students in small groups.
2. Give each group several objects to test (paper cup, car, block, etc.).
3. Have each group make a starting line with masking tape.
4. Have each group pick one object to test first.
5. Have each group weigh the object to determine how heavy or light it is. Have students record the object's weight.
6. Ask students to put the object on the starting line and give it a gentle push.
7. Repeat with a medium push and then a hard push.
8. Have students record and/or discuss how the object's motion was changed with each different amount of force.
9. Repeat the experiment (steps 4-7) for each different object.
10. Bring the class together and discuss what students noticed.
11. Talk about the four forces of flight with the class:
    a. Thrust: pushes an airplane forward (have everyone push hands forward)
    b. Drag: air resistance that pushes against the airplane (have everyone pull hands backwards)

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

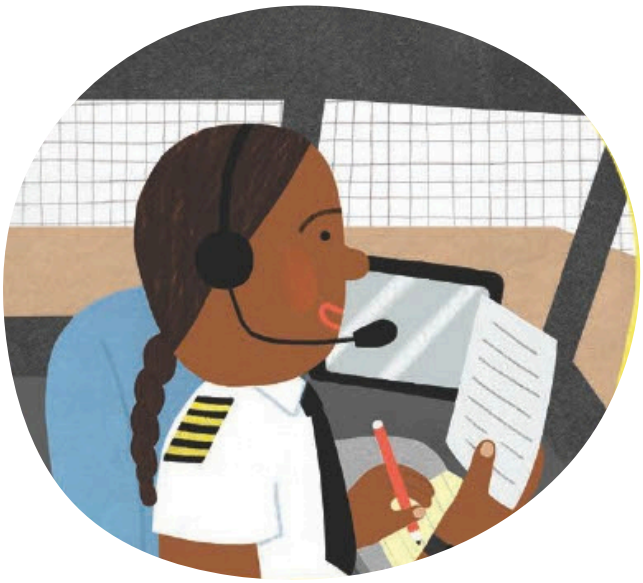
c. Lift: the force that pushes an airplane up (have everyone push hands up)
d. Weight: gravity pulling the airplane downward (have everyone push hands down)

12. Explain that these forces are acting on airplanes at the same time, and changes in these forces can change the airplane's motion.
13. Just like you changed the motion of the object with varying levels of force, an airplane's motion changes when the force acting on it changes.

DISCUSSION QUESTIONS

- What do you think happens when an airplane's engine provides more thrust?
- Did the weight of an object change how far it went? Did the lightest object go the farthest or shortest distance?
- Which objects do you think had the most drag? Why?
- Why does an airplane need more than one force to fly?





EDUCATORS – CONNECTION TO STANDARDS:

K-**PS2-1** - Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
NGSS 2-PS1-1 – Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

WHERE WOULD YOU FLY AN AIRPLANE?

If you were a pilot, where would you fly your airplane? What time of day would you fly? Why? Draw a picture and write below.

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

WHO HELPS AN AIRPLANE FLY?

"VROOM! Engines on. Runway, here I come!"

Who helps an airplane get ready for the runway? Who helps the airplane have a safe flight? Draw a line from the person to their work.

Dispatcher	manages the whole airport's operations
Cleaner	cleans the airplane cabin before between flights
Pilot	flies the airplane
Airport Planner	works on the ground to prepare the airplane for take off
Flight Attendant	helps passengers and keeps them safe
Mechanic	checks the airplane parts so it's safe to fly
Ramper	creates the airplane's flight plan
Air Traffic Controller	directs aircraft traffic including takeoff and landings

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

I FLY READING COMPREHENSION

Every flight has a story! Answer the following questions about the story's characters, beginning, middle, end, problem, and solution.

1. Who are the characters in the story?
- a. Pilot
- b. Flight attendant
- c. Mechanic
- d. Passenger
- e. All of the above

2. Where does the story take place?
- a. At an airport/airplane
- b. At a farm
- c. At a school

3. What happens at the beginning of the story? (Circle 3)
- a. Mechanic Checks the airplane
- b. Flight attendant brings a snack
- c. Bags are loaded
- d. Pilot climbs inside

4. What happens during the flight? (Circle 3)
- a. Airplane takes off
- b. Flight attendants check on passengers
- c. First officer does a walk around
- d. Pilot talks to air control to change paths

5. What happens at the end of the flight? (Circle 3)
- a. Plane starts to descend
- b. Passengers deplane
- c. Flight lands
- d. Bags are loaded

6. The airplane's path needs to change due to weather. What should the pilot and crew do?
- a. Ignore the weather, it might change
- b. Check with air control and change the flight path
- c. Turn off the airplane

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

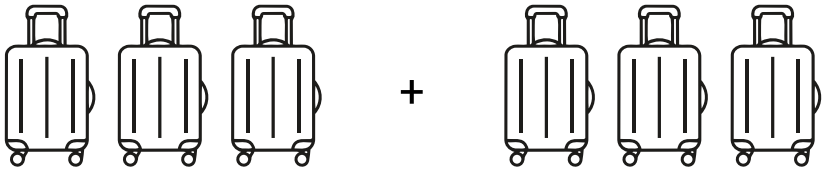
I FLY ADDITION MATH WORKSHEET

Find the sum or difference.

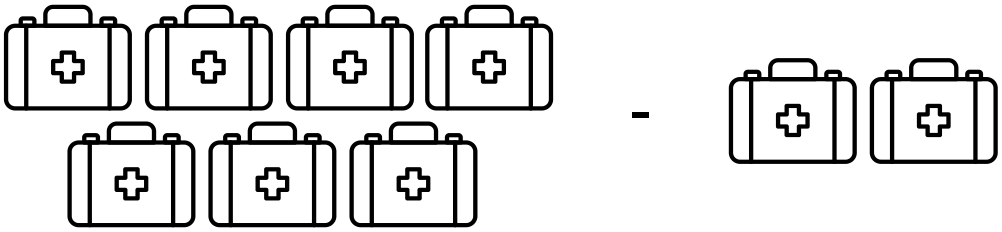
4 airplanes + 2 airplanes = _____ airplanes.



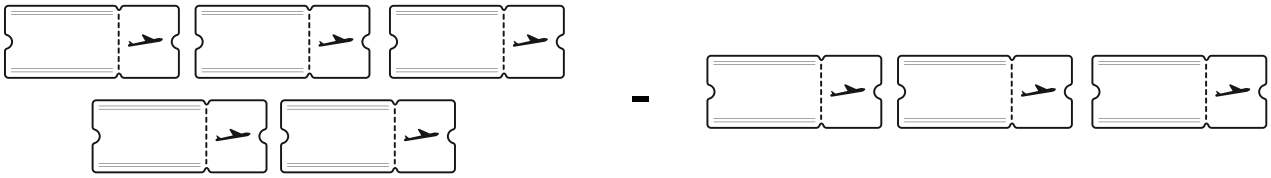
3 suitcases + 3 suitcases =_____suitcases.



7 first aid kits - 2 first aid kits =_____first aid kits.



5 plane tickets - 3 plane tickets =_____plane tickets.

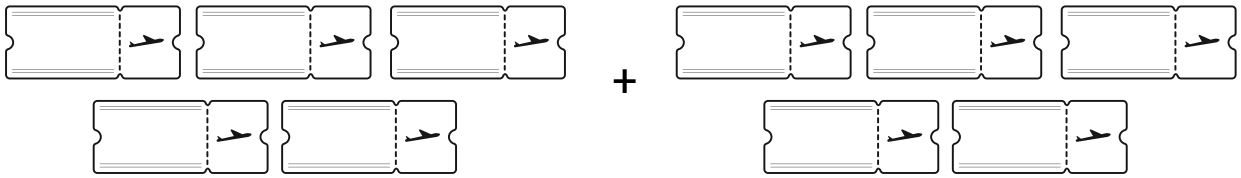


2 suitcases + 3 flight suitcases =_____suitcases.

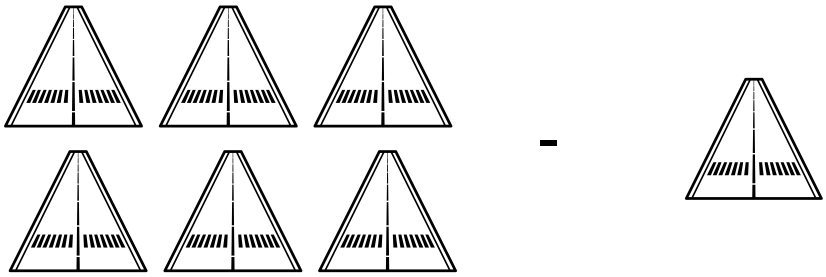


This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

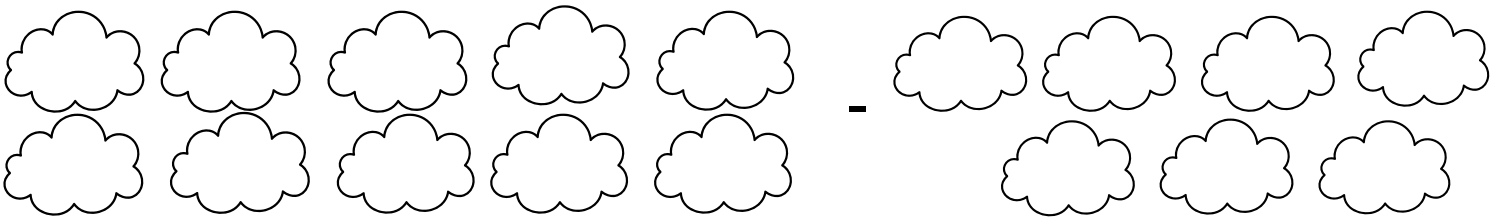
5 plane tickets + 5 plane tickets =_____plane tickets.



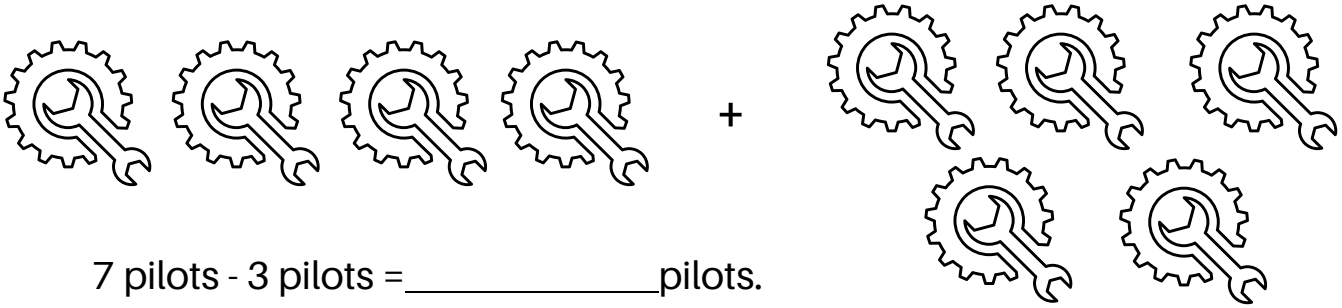
6 miles - 1 mile =_____miles.



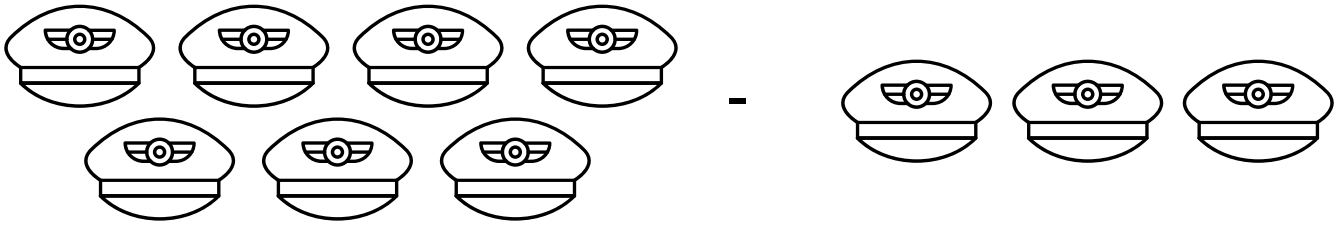
10 clouds - 7 clouds =_____clouds.



4 mechanics + 5 mechanics =_____mechanics.



7 pilots - 3 pilots =_____pilots.



This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

I FLY WORD WORK

Fly

Lift

Go

Plane

Pilot

Land

Beep

Trip

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

STORY SEQUENCE: HOW AN AIRPLANE GETS FROM GATE TO GATE

How does an airplane get from gate to gate?

Number them from 1-10 in order it happens.



___ The airplane lands on the runway
___ Travelers board the plane
___ The pilot follows the route
___ The mechanic checks the airplane
___ The airplane descends
___ The travelers deplane
___ The engines turn on
___ The rampers prepare the airplane
___ The airplane takes off
___ The door closes and the seatbelt sign comes on

What was your favorite part of *I Fly*? Why?

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

EXPERIMENT:
PAPER AIRPLANE DESIGN TEST

"My trusty turbofans send me up, up, up—to zip around the world, with precious cargo in tow."

An airplane's design can affect how well it flies! In this activity, students will design and test different airplanes to see how design changes the distance, direction and stability.

WHAT YOU NEED

- 2 pieces of paper per group
- Paper airplane directions or examples
- Measuring tape or meter sticks
- Student worksheet
- Pencils
- Open space for testing



DIRECTIONS

1. Before the experiment, introduce the four forces that act on an airplane. These are also outlined in the backmatter of the book *I Fly*.
    a. Lift - the force that pushes upwards on an airplane.
    b. Weight/Gravity - the force that pulls the airplane towards earth.
    c. Thrust - the force that moves the airplanes forward.
    d. Drag - air resistance that pushes against the airplane.
2. Tell the students they will be creating their own airplanes today. Their airplanes will be up against each of these different forces and it's their job to figure out how their design affects airplane performance.
3. Next, divide students into groups of two.
4. Offer sample airplane ideas on the board, by demonstration, or have paper airplane books to reference.
5. Give each group of students two pieces of paper. Their job is to work together to create two different airplanes. Encourage them to think about things like the shape and size of wings, nose, folds, and overall shape of an airplane. Make sure the two airplanes have 1-3 differences.

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

6. After creating their airplanes, have students work through the following questions and determine the plane's characteristics.
    a. Does the airplane have small or large wings?
    b. Are the wings wide or narrow?
    c. Is the nose heavy or light?
    d. Is the airplane long or short?
7. Label the finished airplanes - Airplane #1 and Airplane #2.
8. Before testing, have students make a prediction on which airplane will fly the farthest? Why?
9. Find a safe open area where students can test their airplanes. Have the students all start on the same line and throw in the same direction.
10. Throw Airplane #1 and then measure and record the distance.
11. Then test Airplane #2 and measure and record the distance.
12. Continue until each airplane has been tested 4 times.
13. Calculate the average distance flown for each airplane. Compare the averages to determine which airplane flew farther.
14. Have students discuss their style of airplane and what they believe helped it fly farther or not very far.
    a. Did the airplane stay straight or turn?
    b. Did it glide or quickly fall?
    c. Did the airplane wobble or travel smoothly?
15. After the experiment discuss with your partner:
    a. Which airplane flew farther? What evidence do you have to support that?
    b. How does the shape of the wings affect the flight?
    c. Which airplane seemed to have more drag?
    d. How did gravity affect your airplane?
    e. Where did the thrust come from in this experiment?
    f. How do you think lift helped your airplane?
    g. If you could redesign your airplane how would you change it?

EDUCATORS – CONNECTION TO STANDARDS:

NGSS 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
NGSS 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

EXPERIMENT: WHY DO AIRPLANE RIDES SOMETIMES FEEL BUMPY?

"Blink, flicker, FLASH! Rain showers in our path. DING!
"Fasten seat belts," Captain says, "It could get bumpy.""

In this experiment students will investigate what happens when the air around an airplane changes. Can you find what conditions will get the airplane the smoothest flight?

WHAT YOU NEED

- One piece of paper per student
- Fan
- Spray bottle
- Starting line (Optional: masking tape if you need to create a starting line)
- Pencils, paper, and measuring tape to record observations.
- A demonstration by you or a sample video such as this one: https://www.youtube.com/watch?v=7Cy3lRJGiR4Directions



This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

DIRECTIONS

1. Have students make a paper airplane by following along with a video or yourself to make the same paper airplanes so that designs are consistent.
2. After creating the airplane but before flying, have students make three different predictions.
    a. In what weather conditions will the airplane fly farthest (still, clear, windy, rainy)?
    b. Will the wind change its path (using the fan)?
    c. Will rain change its path (using the spray bottle and the rain)?
3. Choose or create with tape a starting line and have students each try to throw the airplane with the same amount of force and in the same direction.
4. Test the airplane under three conditions:
    a. Trial 1: still air - no fan or spraying
    b. Trial 2: with a fan blowing across the airplane's path
    c. Trial 3: rain and moving air, fan blowing and a spray bottle creating rain
5. Repeat each condition 2-3 times, recording the distance each time, to find an average distance for each trial.
6. Determine which air conditions allowed the airplane to travel the farthest? Fastest? And which if any changed paths due to the air?

DISCUSSION QUESTIONS

- Which condition created the most predictable flight?
- What happened after the air started moving with the fan?
- What happened when the "rain" happened?
- What can create turbulence on a flight?
- Why should you put your seatbelt on when turbulence occurs?
- Do airplanes always take the same path?

EDUCATORS – CONNECTION TO STANDARDS:

NGSS 3-PS2-1 – Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
NGSS Science & Engineering Practice: Planning and Carrying Out Investigations – Students conduct repeated trials while changing air conditions.
NGSS Science & Engineering Practice: Analyzing and Interpreting Data – Students record, compare, and analyze flight distance, speed, and path.

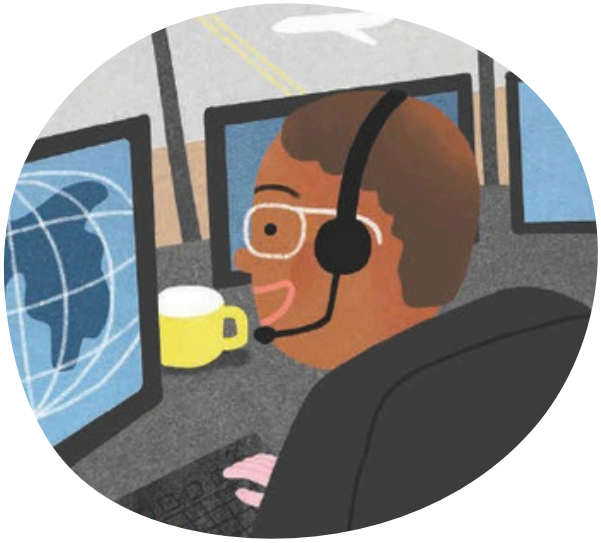
This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

AIR TRAFFIC COMMUNICATION CHALLENGE

"Surrounded by miles of clouds, it may seem like I'm alone, but at any time, on any day, thousands of airplanes fly the earth's skies. And we aren't the only aircraft up here . . ."

Airplanes don't fly alone! In this activity, students will practice planning flight paths and using clear communication as a team.

WHAT YOU NEED



- Simple "Sky Map" with 3 different paths
- Helicopter, airplane, spaceship cards
- White paper for students
- Assortment of picture cards
- Timer

DIRECTIONS

1. Divide students into small groups of 3-4 students.
2. Give each group a simple "sky map". Each map should have three flight paths and some cross overs.
3. Also give each group a helicopter, airplane, and spaceship card.
4. Challenge students to work together with their group to find a path for each type of aircraft without crashing during flight.
5. Students will need to communicate and work together to decide when and where each aircraft should go.
6. Once they complete the map ask groups to share what worked for finding a different path for each one.
7. Next, give each group a few pieces of paper and a pencil.
8. Choose one student to receive a picture card. This student should not show the group the card.

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

9. The other students will have the paper and pencils.
10. The student with the card will have 2 minutes to describe the picture while the rest of the group tries to draw it.
11. When the timer rings, have students compare their drawings to the original.
12. Bring the class back together to discuss why clear communication is important when flying.

DISCUSSION QUESTIONS

- How did your group decide who should go first and what paths to take?
- Did you have to communicate and adjust along the way?
- What could happen if a pilot didn't know where another aircraft was going?
- Why do you think different aircrafts need different paths?
- Was it easy or difficult to draw the picture without seeing it?
- What happened when the directions were unclear?
- How is this activity similar to the way pilots communicate?
- Why is clear communication especially important when multiple aircrafts are in the air?

EDUCATORS - CONNECTION TO STANDARDS:

CCSS.ELA-LITERACY 3-5 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3, 4, 5 topics and texts, building on others' ideas and expressing

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

WHERE IN THE WOLRD WILL IT GO?

Students will brainstorm and write a creative story with a beginning, middle, and end about their very own airplane.

Where is the airplane going?

What will it carry in its cargo holds?

Who is the pilot? Are they leaving home or returning home?

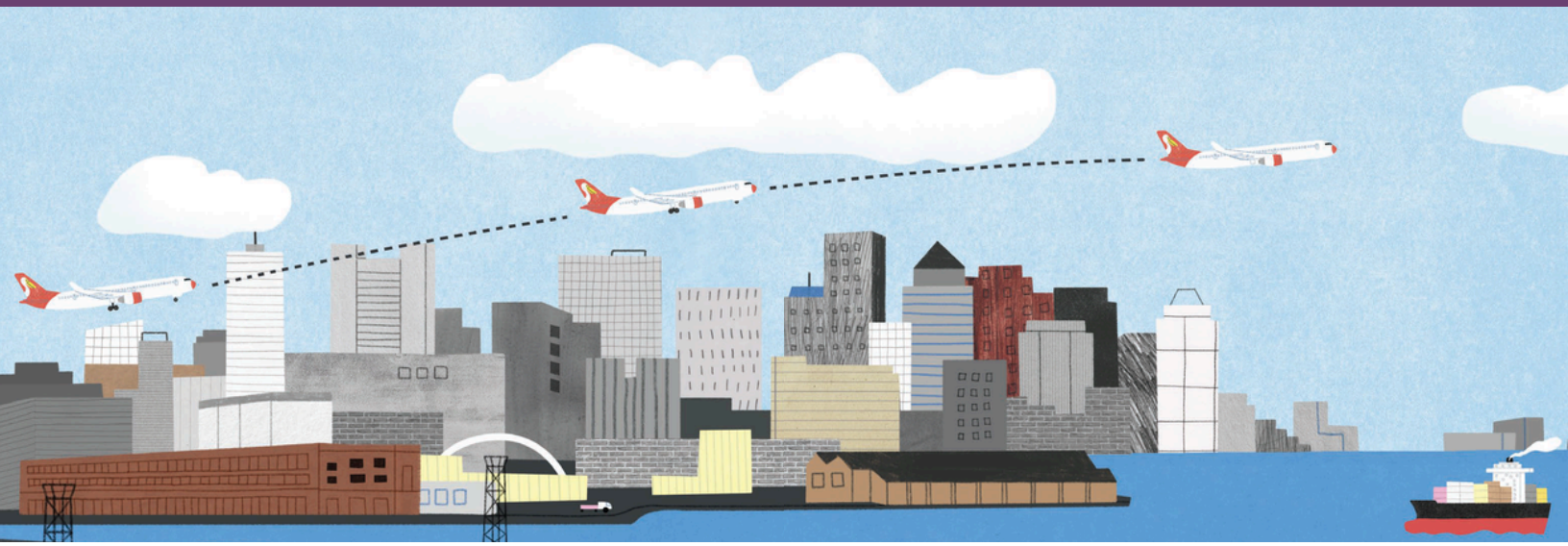
What is your story's problem?

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

BEGIN YOUR STORY HERE:

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

AIRPLANE WORD PROBLEMS



1) 8 airplanes are in the sky right now. ¼ of them are going to New York City. How many airplanes are going to New York City?

2) An airplane has 6 rows with 4 seats in each row. How many seats are there all together?

3) A flight crew loads 7 suitcases into each luggage cart. There are 6 luggage carts. How many suitcases are loaded?

4) A pilot practices 4 takeoffs each day for 5 days. How many takeoffs does the pilot practice?

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.

5) There are 56 passengers boarding the plane. They are divided equally into 7 groups. How many passengers are there in each group?

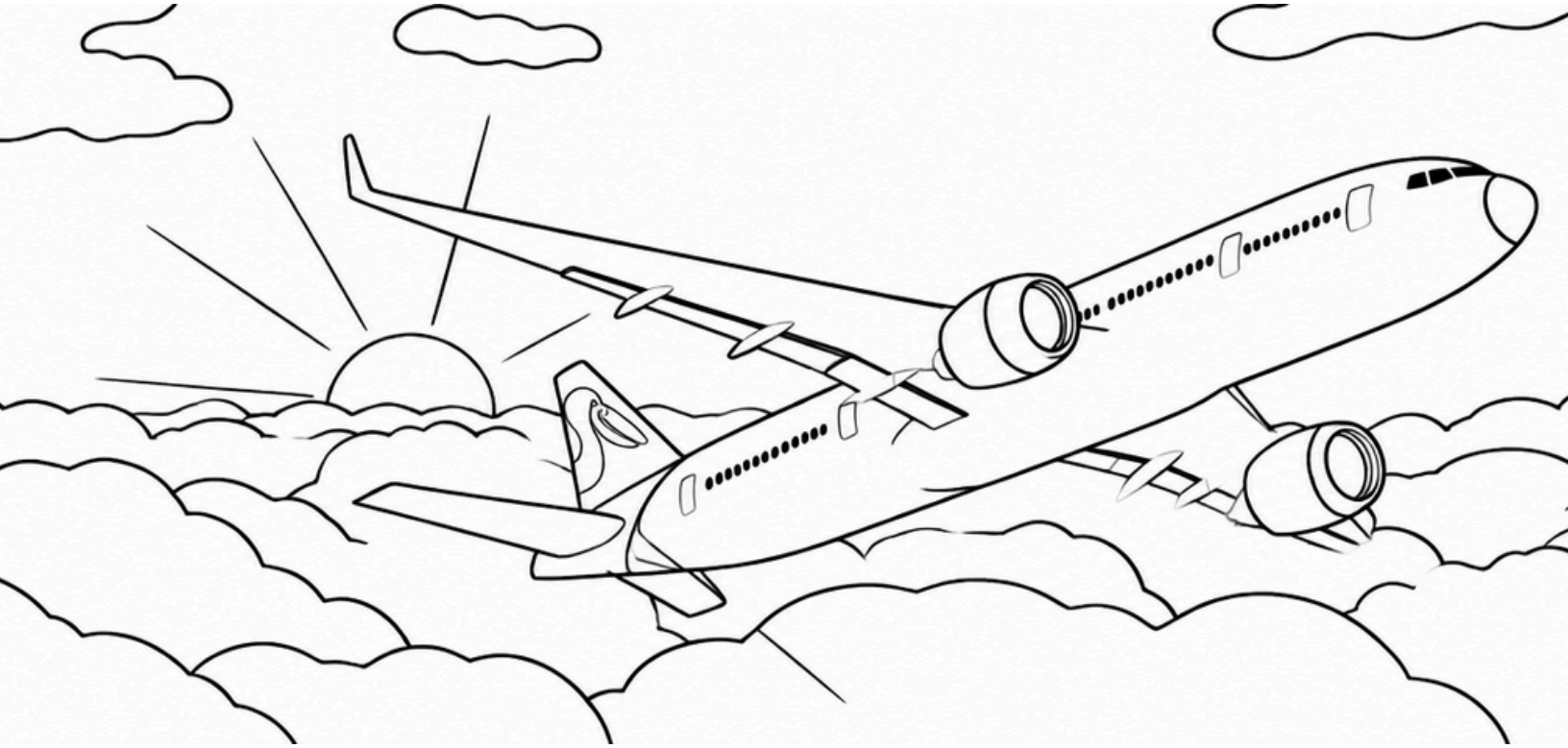
6) A flight attendant is in charge of checking 8 rows. There are 6 seats in each row. How many seats does the flight attendant check?

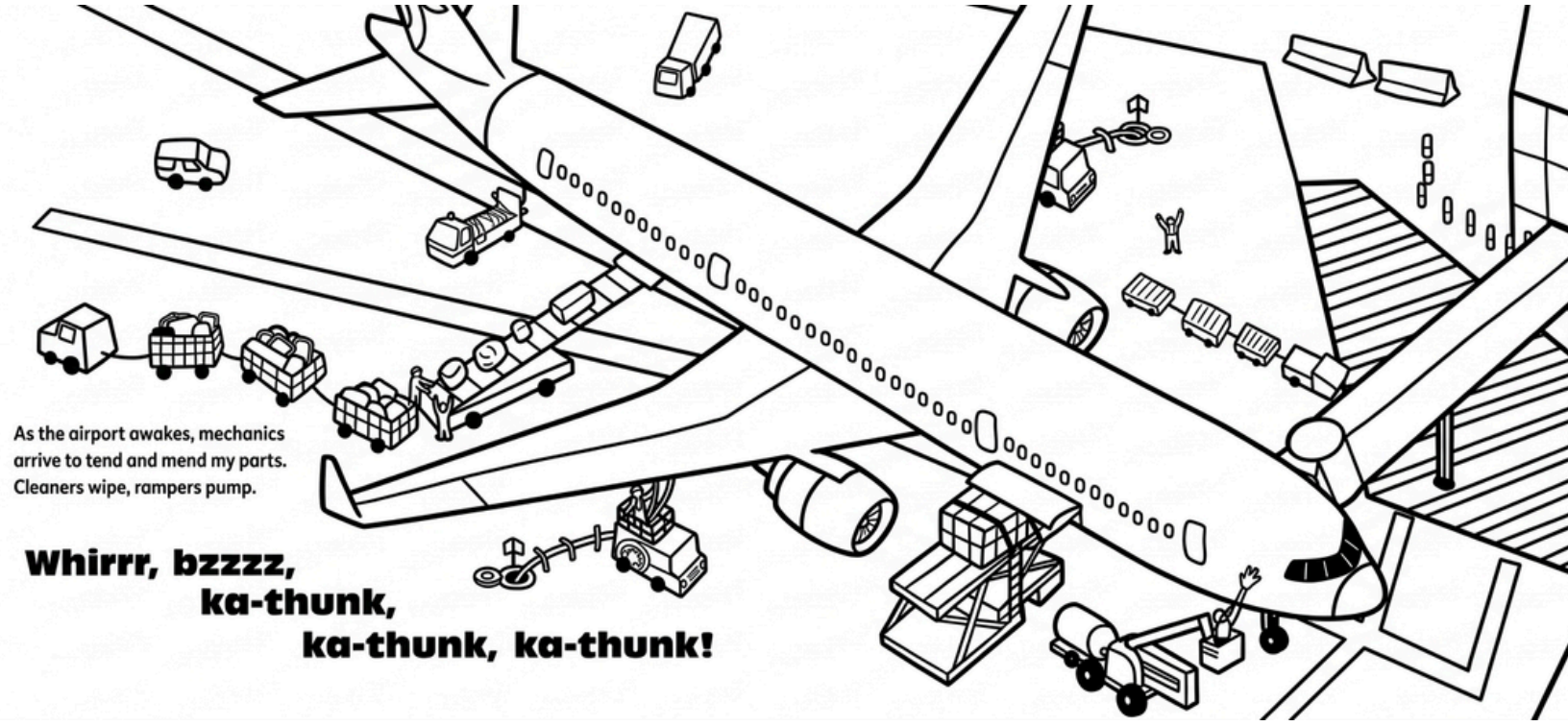


7) An airplane has 36 passengers sitting equally between 6 rows. How many passengers are in each row?

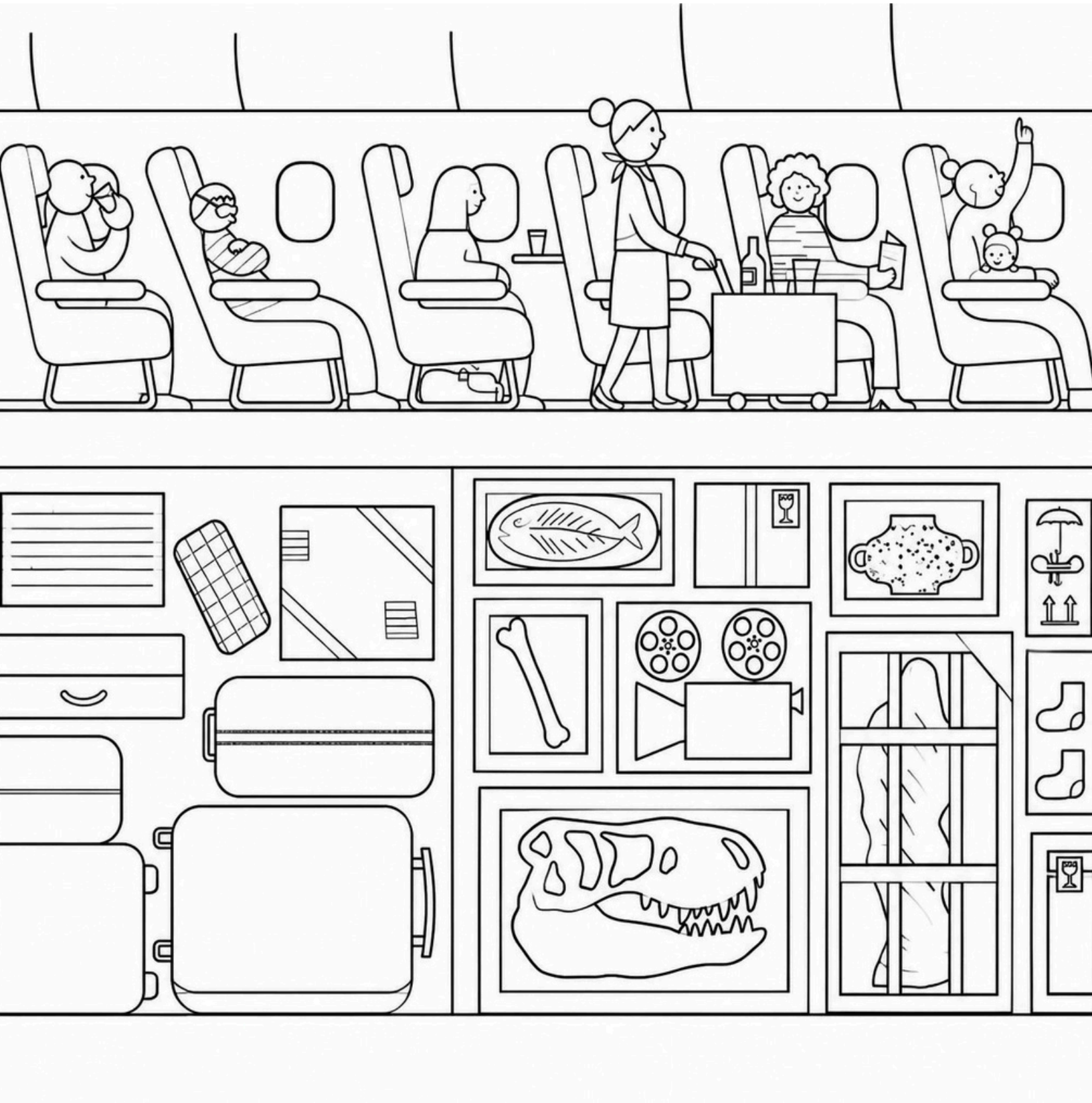
8) An airplane is carrying 18 sleeping pets. 9 are dogs, 3 are cats, 3 are birds, 2 are monkeys for a zoo, and 1 is a iguana. The pets are in 3 equal rows of cages. How many animals are in each row?

This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.





This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.



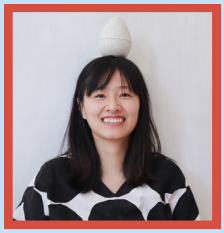
This guide was created by Grace Nowatzke and Kelly Rice Schmitt
© 2026 Lerner Publishing Group. Illustrations © 2026 by Jam Dong. All rights reserved.
This page may be reproduced for free distribution for educational purposes.



I Fly: An Airplane's Fantastic Flight
Ages 5 - 9 LB: 979-8-7656-1983-4 • $20.99 (list)
EB: 979-8-3480-4864-8 • $34.65 (list) • $25.99 (S&L)



Kelly Rice Schmitt is an author of STEAM children's literature. She holds a B.B.A in finance and Chinese from the University of Notre Dame and is an advocate for girls in STEM, business, and other fields with gender gaps. She can be found in North Carolina helping other traders grow their businesses, writing for children, and exploring, singing, and creating with her husband and young children.



Jam Dong was born in Shanghai, China. She has an MA degree of moving image from University of Arts London and graduated from Maryland Institute College of Art in 2021 with an MFA in illustration practice. She likes to use bright colors and simple shapes to build the imaginary world inside her mind. The beauty of nature provides her with inspiration all the time. She is a freelance illustrator based in Boston, Massachusetts.

Lerner