Our Airplane Adventure

Grades K-2

As young students play, they develop an understanding of science and engineering concepts. “Our Airplane Adventure” provides an opportunity for students to imagine being a pilot and getting ready to fly, as they use a checklist to make sure the airplane has all the needed parts and is ready to fly, just as actual pilots do each time they fly.

Through music and movement, students can discover how the different parts of an airplane help make it fly, as well as what those movements look and feel like. Through this learning experience, students will begin to explore and develop language describing an airplane, its parts, and how the whole plane works together as a system.

Next Generation Science Standards (NGSS)

Science and Engineering Practices

- Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
- Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

Educator Notes

Overview

The “Our Airplane Adventure” learning experience was designed for formal and informal educators at museums, science centers, and schools. Join NASA to learn about how different parts of an airplane work together to help the plane fly. Students will begin with a preflight inspection of a model airplane. With the checklist complete, students will be ready to fly! Utilizing the song, I’m Gettin on an Airplane and its accompanying video, students can use simple choreography to understand how the different parts of a plane work together to help a plane fly!

Learning Objectives

Students will:

- Develop the vocabulary to describe different parts of an airplane using a model
- Discover ways individual components of an airplane work together to help a plane fly
- Explore the movements of an airplane using simple choreography
- Begin to visualize the different parts and movements of an airplane model

Quick Start List

Decide

- Airplane model/diagram for preflight
- Decide on chalk, masking tape, or paper

Print

- Airplane model diagram (one for each student or a large version in chalk or tape on the ground for the whole class)
- Pilot checklist (one for each student)
- Gear pin flag (one for each student)

Materials

- String or yarn for flag (four inches per student)
- Red crayons (one for each student)
- Hole punch
- Materials to make an airplane model for preflight
- Safety scissors
- Writing utensils
- Optional: Clipboards

Plan

- Room to dance and move
- Music player
- Access to I’m Gettin on an Airplane song
- Video player
- Access to I’m Gettin on an Airplane video

Safety

- Confirm participants carefully support the piece being cut and are careful with the placement of their supporting hand
- Have participants practice safe cutting techniques and scissor handling when cutting
- Restrict movement about the room with scissors or other sharp objects
- Consider what modifications can be made for all students to participate in the movement portions of the lesson safely and comfortably
- Be aware of neurodiversity and the need for noise mitigation
- Attempting to fly your cut out airplane is not permitted

Preparation

To prepare for “Our Airplane Adventure” consider the constraints and area that is available.

Decide:

- If students should conduct the preflight outside OR inside the learning space
- If the class will work together around one big airplane OR if each student will have their own small airplane
- Consider choosing a space that allows room for some dancing and music!

Our Airplane Adventure Preparation

Learning Activity	Materials	Considerations
Preflight Inspection Checklist	Checklist: • “Remove Before Flight” flag (s) • String or yarn • Hole punch • Safety scissors • Red crayon to color the flag • Writing utensil • Optional: clipboards for the checklist	Depending on the age of the students, determine their experience using scissors. This will change the safety considerations and timing of the lesson. If students are unable to help in the construction process various steps can be done ahead of time.
Preflight Airplane Model Diagram	Masking tape OR Sidewalk chalk OR Paper airplane outline/picture	There are many ways to make an airplane model. The model you choose will change the materials needed. Consider allowing more time for students to continue to play after completing the activity.
I’m Gettin on an Airplane	Access to multimedia to play the I’m Gettin on an Airplane video and song	Consider what modifications can be made for all students to participate in the movement portions of the lesson safely and comfortably. Be aware of neurodiversity and the need for noise mitigation.

Airplane Model Choice

There are a few options for creating an airplane model to use for the preflight inspection:

A. Draw an airplane with sidewalk chalk on the playground,

B. Make an airplane outline on the floor with masking tape, OR

C. Provide students with a diagram of an airplane on a sheet of paper

Language Development

Young learners constantly discover new words to describe what they are learning. Allowing them to develop and search for words as they learn to visualize and name the parts of an airplane provides a solid foundation on which they can continue to build their understanding of airplanes and flight. It is a balancing act between naming something for a student and having a student discover and label something on their own. The checklist on page 12 provides a way for students to discuss and apply names to a model airplane on their own. As an educator, your expertise and understanding of your students' language development can guide you in deciding which checklist you choose and what additional support your students need.

Activating Background Knowledge

Invite students to imagine they are getting on an airplane ready to fly. Open with a discussion using the questions (see box) to help students connect the lesson with their lives and experiences. Let students know their first task will be to make sure their planes are ready to fly. Next, they will pretend to be airplanes and move like an airplane in flight.

Discussion Questions:

- What do you know about airplanes?
- What parts do airplanes have?
- Who flies a plane?
- Who works on airplanes?
- Have any of you ever flown on a plane?
- Why do people use airplanes?

ACTIVITY ONE
GETTING READY TO FLY

Introducing Checklists

Pilots must pay attention to a lot of details to help keep procedures consistent. To ensure they don't forget any steps, they work with checklists. One checklist they use before every flight is the "Preflight Inspection Checklist." A pilot will walk around the airplane and check each item on their list to ensure the plane is ready to fly. They also remove any red "remove before flight" flags that are attached to coverings, pins, or other items that keep the airplane protected when not in use.

Introducing students to this idea with a discussion, photo, or video can help them imagine themselves completing a checklist. Using the transition questions in the box below can help connect the learning.

NASA pilot Dave Wright reviews pre-flight checklist prior to take-off. Credit: NASA

Begin the lesson by having students cut out their checklist and put their name on it. Next, have students cut out the gear pin flag, put their name on the back, and color it red. Depending on the students' age, they may need help punching a hole in the flag and tying a string loop at the top. **Now they are ready for a preflight inspection!**

Teacher Tip – *"Remove Before Flight" flags are used in multiple locations on a plane that may require attention from the pilot during the preflight checklist. For this lesson, the example flag is placed on the gear pin on the front wheels.*

Transition Questions:

- Has anyone ever seen a checklist?
- What do you think we need to check before we fly?
- Who should be checking the plane?
- Should anyone besides the pilot check the plane?
- Why do you think (insert an airplane part name) is important?

Checking the Checklist

1. Let students know their goal is to complete the checklist and when the last item on the list, a gear pin flag, is picked up they get to keep it to help them to share their story about how airplanes get ready to fly
2. Provide each student with a clipboard (or a firm surface to write on), a writing utensil, and a checklist
3. Depending on what airplane model(s) you chose, students can work on their individual plane model or take turns walking around a larger model on the ground
4. Taking turns, each student should begin by taking their flag and placing it on the model's front wheels
5. Working in teams, students should assist each other on parts of the plane they do not know while walking to each part of the plane and checking each part off their list
6. Double-check to ensure students have looked at everything (Hint: There are two engines!)

Teacher Tip – *The lesson will require different group management practices depending on which model of an airplane you decide to use. Some models may require each small group to work on a large model or require each student to have their own paper diagram.*

After the students have completed the checklist above, have them pick up the gear pin flag reading “Remove Before Flight” off the wheel.

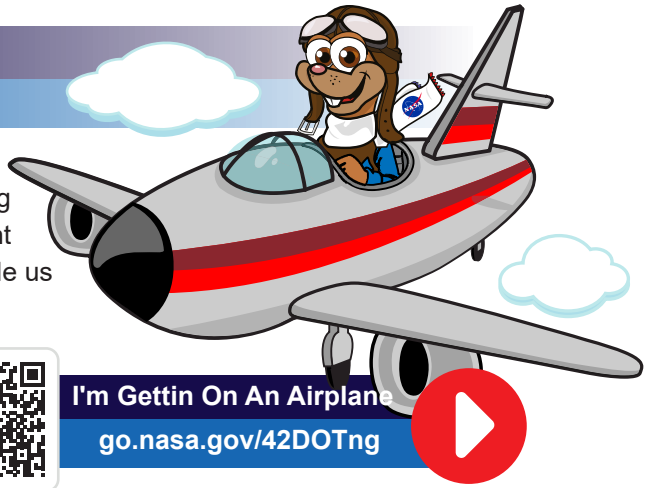
Transition Questions

What else, besides the airplane, should we check before we fly?

- Have students start a list.
  Some important things might include: the weather, air traffic, cargo, and gas levels.

We Are Ready to Fly!

ACTIVITY TWO
GETTING READY TO FLY



Introduction

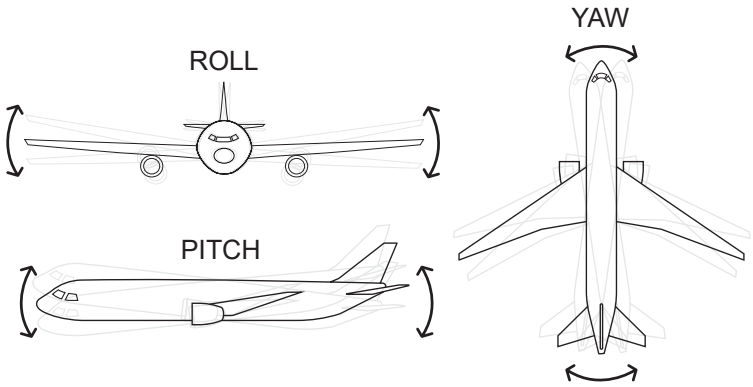
Orville will be your co-pilot on our pretend flight today. We have a fun song about getting on an airplane that will help us learn more about the different parts of an airplane and how each part helps the plane fly. Orville will guide us through this flight!

Play the video for the students. Consider having the students watch the video again and sing along during the second showing.

I'm Gettin On An Airplane
go.nasa.gov/42DOTng

Taking Flight

1. Ask students if they would like to learn the song and create some flight movements to go with it
2. Have the students pretend to be airplanes and ask them to move about the room as if they are airplanes
3. Carefully observe their movements for examples of pitch, yaw, and roll
4. Each time a student demonstrates a good example of a part of the airplane or a movement such as pitch, yaw, and/or roll, ask the students to freeze
5. Have the student demonstrate the part or movement to the rest of the class



6. Pitch, yaw, and roll are new words so be sure to have more than one example
7. You can do this activity several times, helping the students continue to review the parts of an airplane and the movements
8. If your students need extra time to learn the words and movements, you can add the "Control Tower Says" idea (see Extend the Fun) and let students continue learning
9. Ask students if they are ready to turn the song into a dance.
10. Play the song and have students think about what dance moves an airplane might make. (Song Link)
11. Play the song again and let students decide which parts to add movement to and which they want to just sing along to.
12. Some ideas for movement are included in Table 2 below. However, this is also a great time to partner with an arts teacher or to have students invent some of the movements.

Extend the Fun

You can have the students pretend the control tower is giving directions. Just like Simon Says – but Control Tower says – take off, stop, roll, yaw, etc. Don't forget to explain what a control tower is!

Teacher Tip – *Sometimes students might want to turn this into a "popcorn activity" where one student steps up to do their movement instead of the whole class. In the background, everybody may have their wings up, while one student demonstrates pitch.*

I'm Getting on an Airplane - Lyrics (Link)

Sample Lyrics	Sample Movement
"I'm getting on an airplane"	Marching
"How does a plane fly?"	Shrug shoulders with hands out and palms up
"Keep it moving through the sky"	Arms out like wings
"Cargo"	Move a pretend box side to side
"Elevator"	Bend knees up and down

Students might enjoy coming back to this song and dance for fun or revisiting the airplane model to see what else they have learned. They could also create their own video for the song.

Educator Resources

Getting on an Airplane Lyrics (Link)
Insert Video Here

Enrichment

If your students want to keep learning, you can leave the airplane model(s) out for further play and imagination. Continuing to play using the new words and understanding about planes can help support language development. Students may also keep their “Remove Before Flight” flag and use it to tell people outside of school their story about how to get an airplane ready to fly.

Below are three additional lessons for students to delve deeper into flight and make connections to their own lives and/or animals around them.

Learn more parts of an airplane and compare them with birds:
www.nasa.gov/stem-content/parts-of-an-airplane/

Build a model airplane and explore how the axes and control surfaces interact:
www.nasa.gov/stem-content/axes-control-surfaces/

Follow the adventures of Orville and make language arts and social studies connections as students sign up to send their names up on a NASA airplane and learn about flight logs as they document or imagine their travel adventures:
www.nasa.gov/wp-content/uploads/2022/01/orville-flight-log-v6.pdf

Checklist

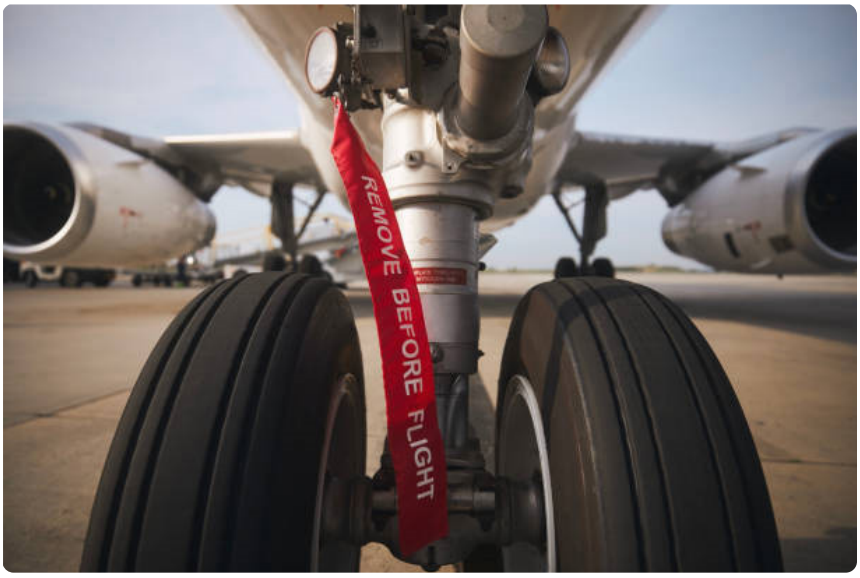
- Nose
- Flight Deck Window
- Engine
- Wing
- Tail
- Engine
- Wing
- Landing Gear – “Remove Before Flight” flag

Note: Printable checklist on page 12

CHECKLIST

- ☐ ***Nose***
- ☐ ***Flight Deck Window***
- ☐ ***Engine***
- ☐ ***Wing***
- ☐ ***Tail***
- ☐ ***Engine***
- ☐ ***Wing***
- ☐ ***Landing Gear*** – “Remove Before Flight” flag
- ☐
- ☐
- ☐

Teacher Tip – Use the blank lines to add additional parts of an airplane as students expand their learning.



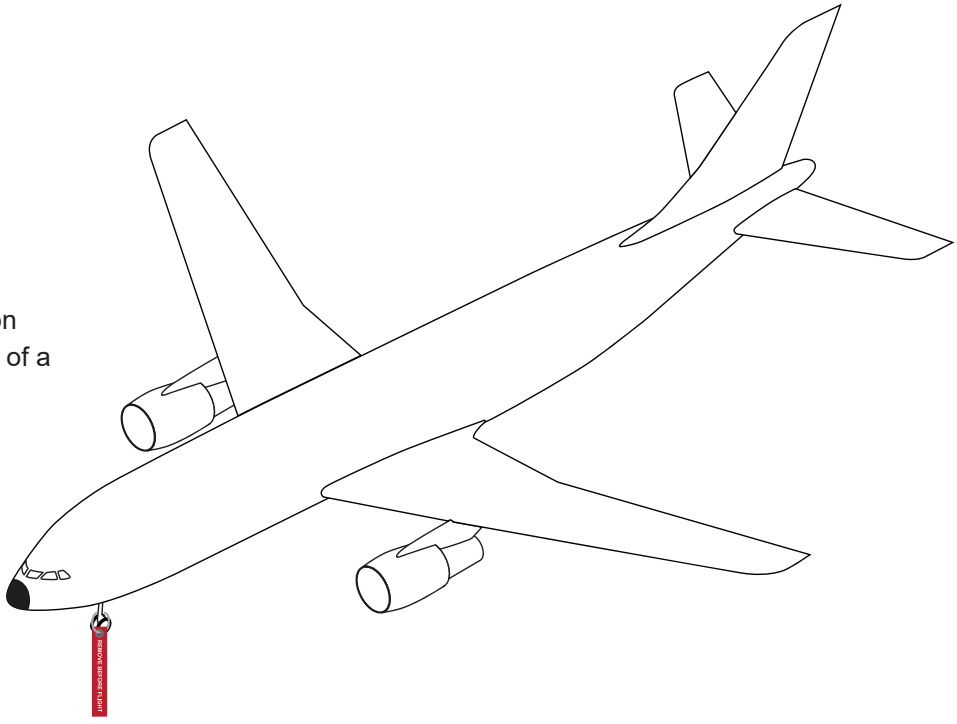
To make the gear pin flag

Note: Printable flags on page 11

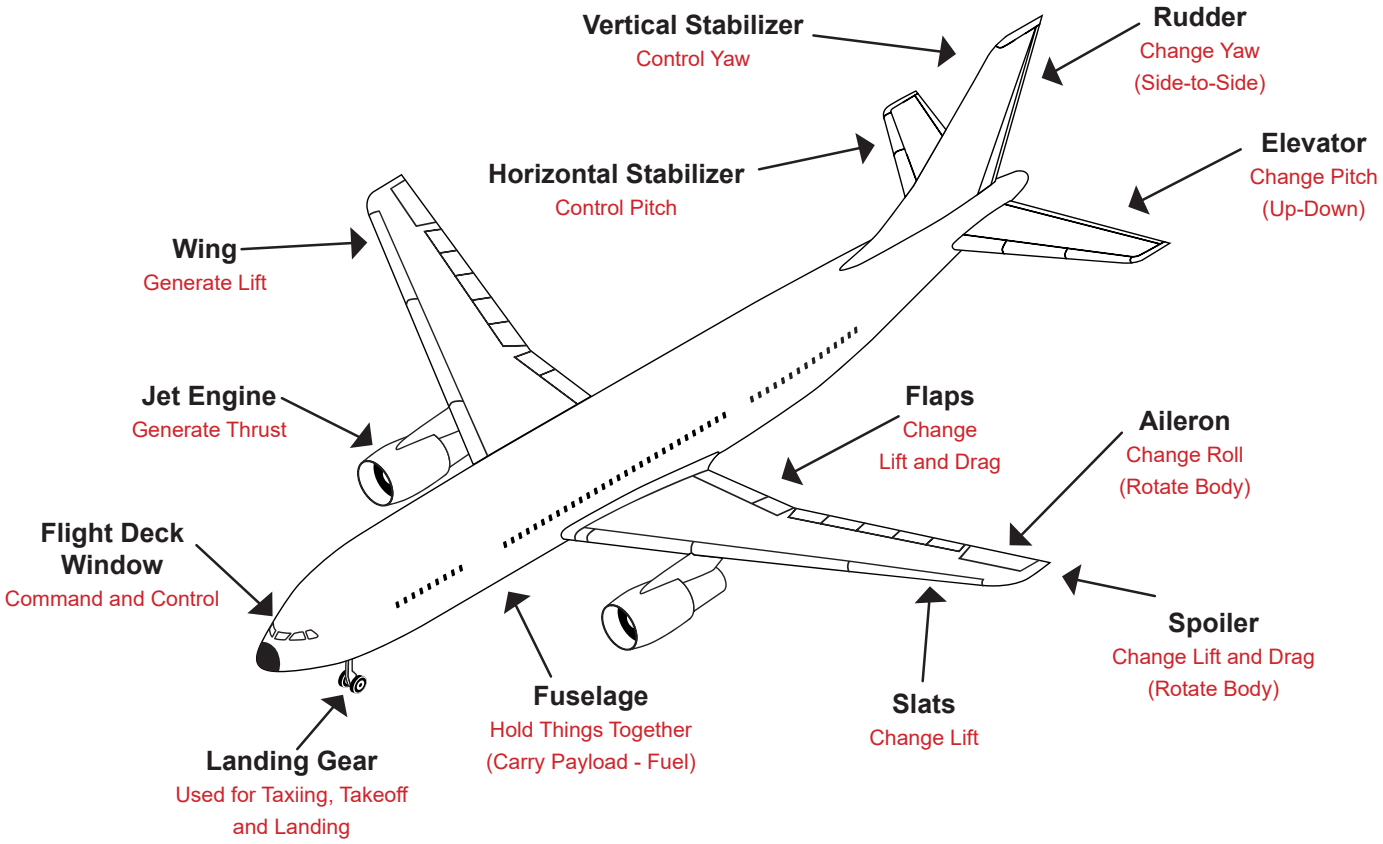
Following scissor safety tips, students should cut along the dotted line on the edge of the flag. The flag should be colored red. To complete the flag, punch a hole in the top on the O, thread the string or yarn through the hole, and tie a knot. *Depending on the age of the students, they may need help tying a knot or cutting.*

Plane Model Outline

Jet outlines can be printed (page10), drawn on the ground with chalk, or outlined on the floor of a learning space with masking tape.



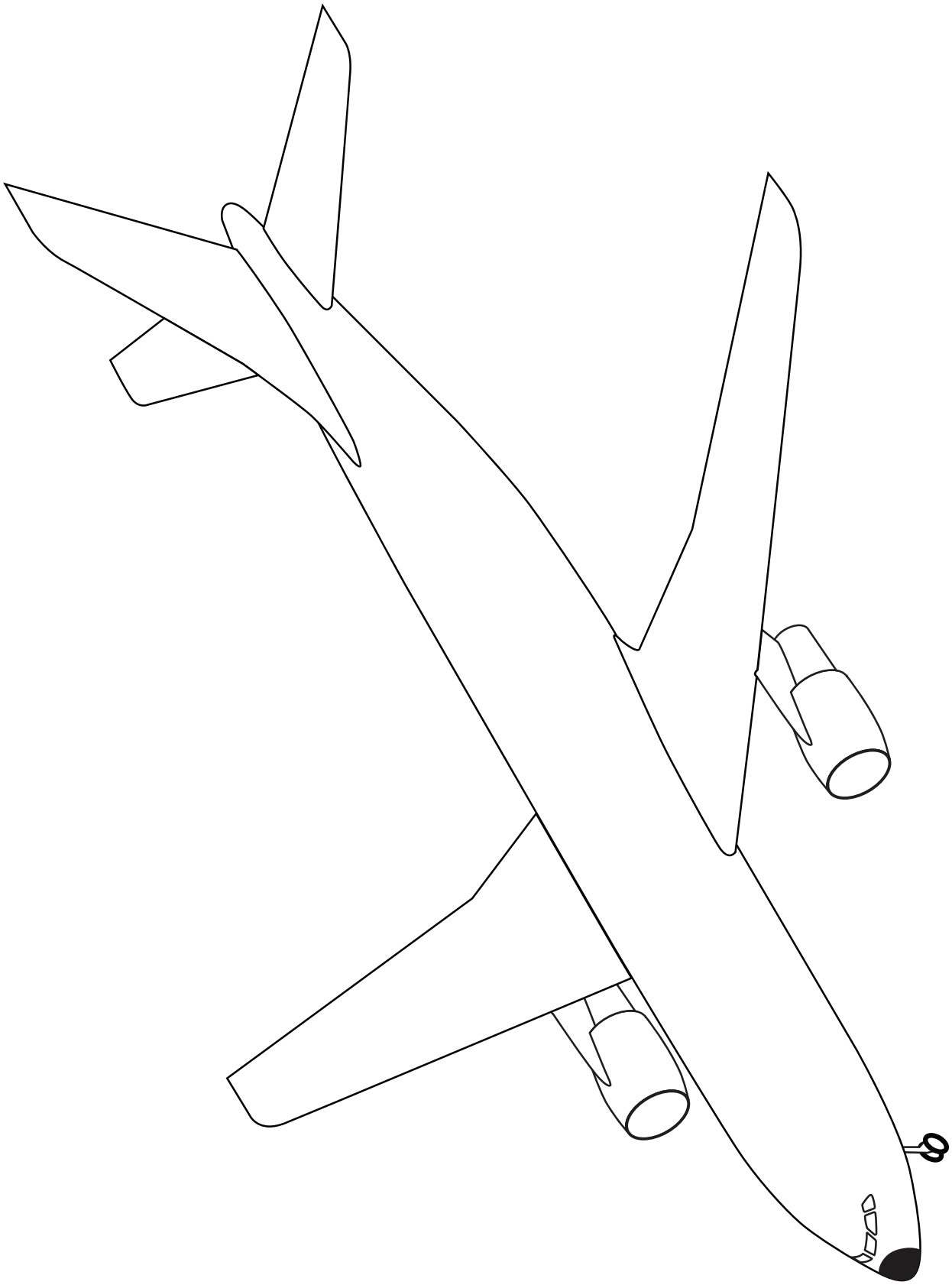
Introduction to Airplane Components:

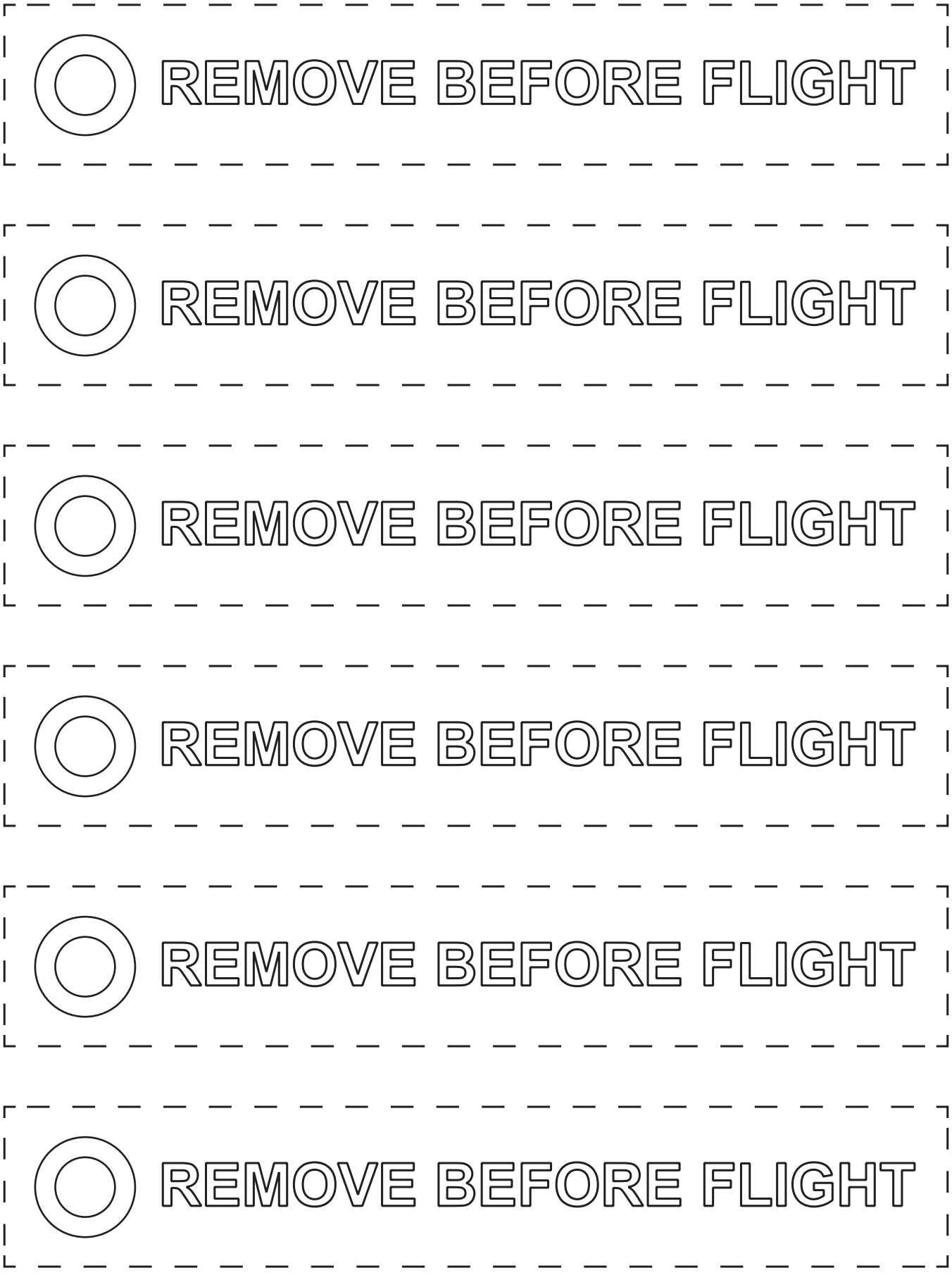


Background Information for Teachers:

For additional information about airplane parts and functions, Nasa Glenn Research Center's Beginners Guide Aeronautics: **www1.grc.nasa.gov/beginners-guide-to-aeronautics/airplane-parts-function/**

Adapted from “With You When You Fly: Aeronautics for PreK”: **nasa.gov/wp-content/uploads/2021/05/aero-prek.pdf** (pg 67)




REMOVE BEFORE FLIGHT
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CHECKLIST

- [ ] **Nose**
- [ ] **Flight Deck Window**
- [ ] **Engine**
- [ ] **Wing**
- [ ] **Tail**
- [ ] **Engine**
- [ ] **Wing**
- [ ] **Landing Gear** – "Remove Before Flight" flag
- [ ]
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Teacher Tip – *Use the blank lines to add additional parts of an airplane as students expand their learning.*

CHECKLIST

- [ ] **Nose**
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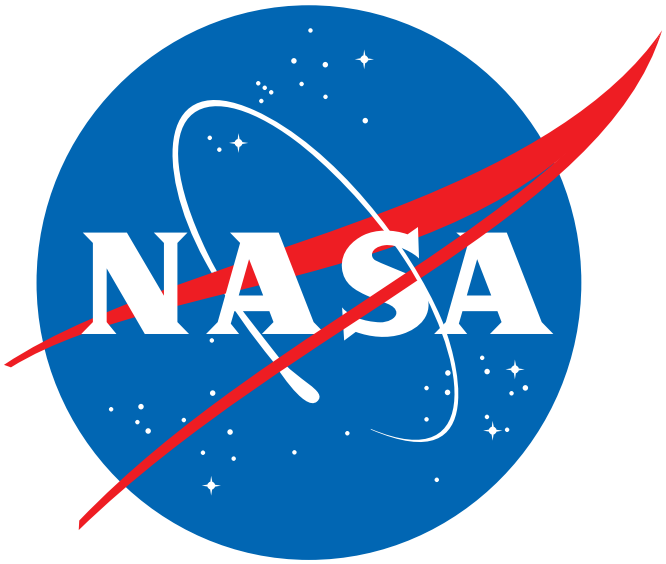

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