

# ACTIVITY 8

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## GOOD ENOUGH TO EAT

### Objective

Students construct an edible model of the space transportation system, or space shuttle, and use it to demonstrate a launch sequence.

### Standards

Science, Mathematics, Technology, Language Arts

### Materials

- Carrots, cleaned and cut in half, lengthwise, 1 per student
- Celery, 2 equal sized pieces per student
- White bread, 1 slice per student
- Knife
- Peanut butter, marshmallow cream, or softened cream cheese
- Plastic knives, 1 per student
- Templates of the orbiter (Figure 14, page 84), copied on index-weight paper or an orbiter cookie cutter
- Paper plates, 2 per student
- Paper towels

- Drawing of shuttle launch to orbit sequence (Figure 12, page 83)
- Drawing of space shuttle parts (Figure 11, page 82)
- Journal or piece of paper, 1 per student
- Chart paper
- Markers or crayons
- Model of the space shuttle, available from toy stores

### Educator Information

- **Before beginning this activity, determine if any student has an allergy to peanuts.**
- This activity may require additional adults to assist the educator. It may work best in a small group environment.
- Make copies of the orbiter template. Use index-weight paper, if available. Cut out. Laminate for future use.
- Depending on the ability level of the students, an adult may need to cut orbiters out of white bread using the orbiter template provided. Use an orbiter cookie cutter if available.



- Before beginning the activity, have an adult wash and cut the vegetables. Cut the carrot in half lengthwise. Cut crosswise to make two large pieces with the large end of the carrot. Place the carrot flat side down on a paper plate. This represents the orange external tank. It is the longest part of the space shuttle.
- For each student, have an adult cut two equal-sized pieces of celery. The celery sticks represent the two equal-sized solid rocket boosters. Make sure they are shorter than the carrot that represents the external tank and longer than the orbiter made out of bread.
- Prepare a paper plate for each student with the vegetables, bread, a plastic knife, and a small amount of peanut butter or alternative spread.
- Before the activity begins, the educator or other adults should practice putting the vegetable and bread orbiter together.
- Review background information on the space shuttle and its parts. Be prepared to share this information with students.
- Refer to the drawing of the shuttle and its parts. Be prepared to name each of the parts and talk about the sizes of the parts.
- Read the following information and be prepared to share it with students.

*There are four orbiters currently in use. Atlantis, Columbia, Discovery, and Endeavour are the names of the orbiters. NASA built two other orbiters. The Enterprise flew only as a test vehicle. In 1983, an accident destroyed the orbiter Challenger.*

*The orbiter is the shortest part of the space transportation system. It is 37 meters in length. The two solid rocket boosters are equal in size. They are taller than the orbiter. Each solid rocket booster is 45 meters long. The orange external tank is the tallest part of the shuttle. It is 47 meters in length.*

## Procedure

1. Review background information on the space transportation system or space shuttle and its parts with students.
2. Refer to the drawing of the shuttle and its parts. Ask students to name each of the parts. Discuss the size of each part. Compare the sizes of the parts. Ask students to name the tallest part and the shortest part of the space shuttle.

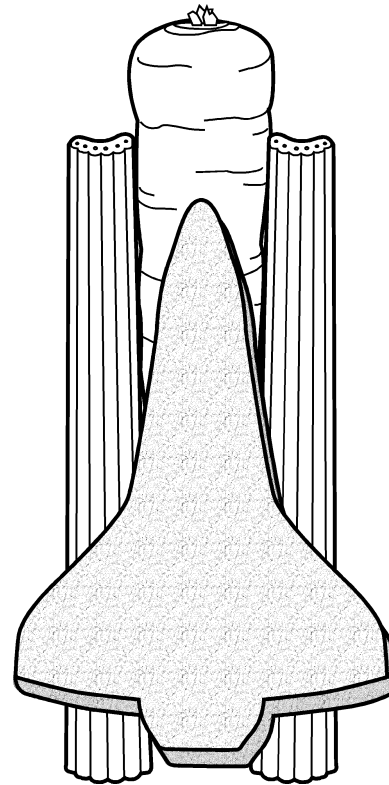


Figure 13. Edible Space Shuttle



3. Pass out paper plates with one carrot stick, two pieces of celery, one bread orbiter, a plastic knife, and peanut butter or alternative spread. Tell students they are going to build a space shuttle out of food. Explain the directions orally and also share the picture charts.
4. Ask students to examine the parts of the vegetable and bread space shuttle. Ask students to guess which food represents each shuttle part. Share that the carrot represents the external tank. The celery sticks represent the two solid rocket boosters. The bread represents the orbiter.
5. Introduce or review the word, *equal*. Discuss that the two celery sticks are *equal* in length.
6. Look at the parts of the space shuttle and describe them using comparison words such as *tallest* and *shortest*, and *taller* and *shorter*.
7. Students attach the celery sticks to the carrot with a small amount of peanut butter or alternative spread.
8. Spread peanut butter or an alternative spread on one side of the bread orbiter and attach it to the carrot external tank. At this point, if necessary, provide a clean plate to each student.
9. When students have completed assembling their space shuttle, it is time for a countdown. Review the diagram of the space shuttle launch to orbit sequence. Demonstrate how to launch the edible shuttle. If possible, hold the vegetable space shuttle upright. Count from 10 to 1 and get ready to liftoff.
10. Soon after launch, simulate the separation of the two solid rocket boosters. Lay the celery sticks back on the plate.
11. Next, simulate the separation of the carrot external tank. Lay it back on the plate.
12. Simulate the orbiter orbiting or circling the Earth and landing back on the plate.
13. Ask students to describe the sequence of events using ordinal numbers such as *first*, *second* and *third*.
14. When the class discussion is finished, students eat the space shuttles they made.

## Assessment

- In a journal or on an individual sheet of paper, students draw a picture of the vegetable and bread space shuttle. Encourage students to draw the vegetables to represent a launch sequence. Have students look at their drawing to determine if the parts are the correct size when compared to each other.
- Using a commercial model of the space shuttle, have students reenact the launch sequence. Ask students to make a comparison of the heights of the space shuttle parts.

## Enrichment

- Count the number of celery sticks in the class by 2's. Count the number of external tanks in the class by 1's.
- Have students draw a picture of a space shuttle launch to orbit sequence in a journal or on an individual sheet of paper. If appropriate, ask students to label the parts and to write numerals under each step.
- Have students build a model of the space shuttle out of blocks, wood, or cardboard boxes. Ask them to sequence a shuttle launch using their model. Help students evaluate and compare the sizes of each part.
- From the *Suggested Reading* list or other sources, select books that feature descriptions and pictures of shuttle launch to orbit sequences. Examples include *The Space Shuttle* by Jacqueline Langille and Bobbie Kalman, *Space Shuttle* by Mark Bergin, and Jan Graham's *Best Book of Spaceships*. Read to the class or have students read individually. Ask students to describe the sequence of a shuttle launch using pictures in the books.



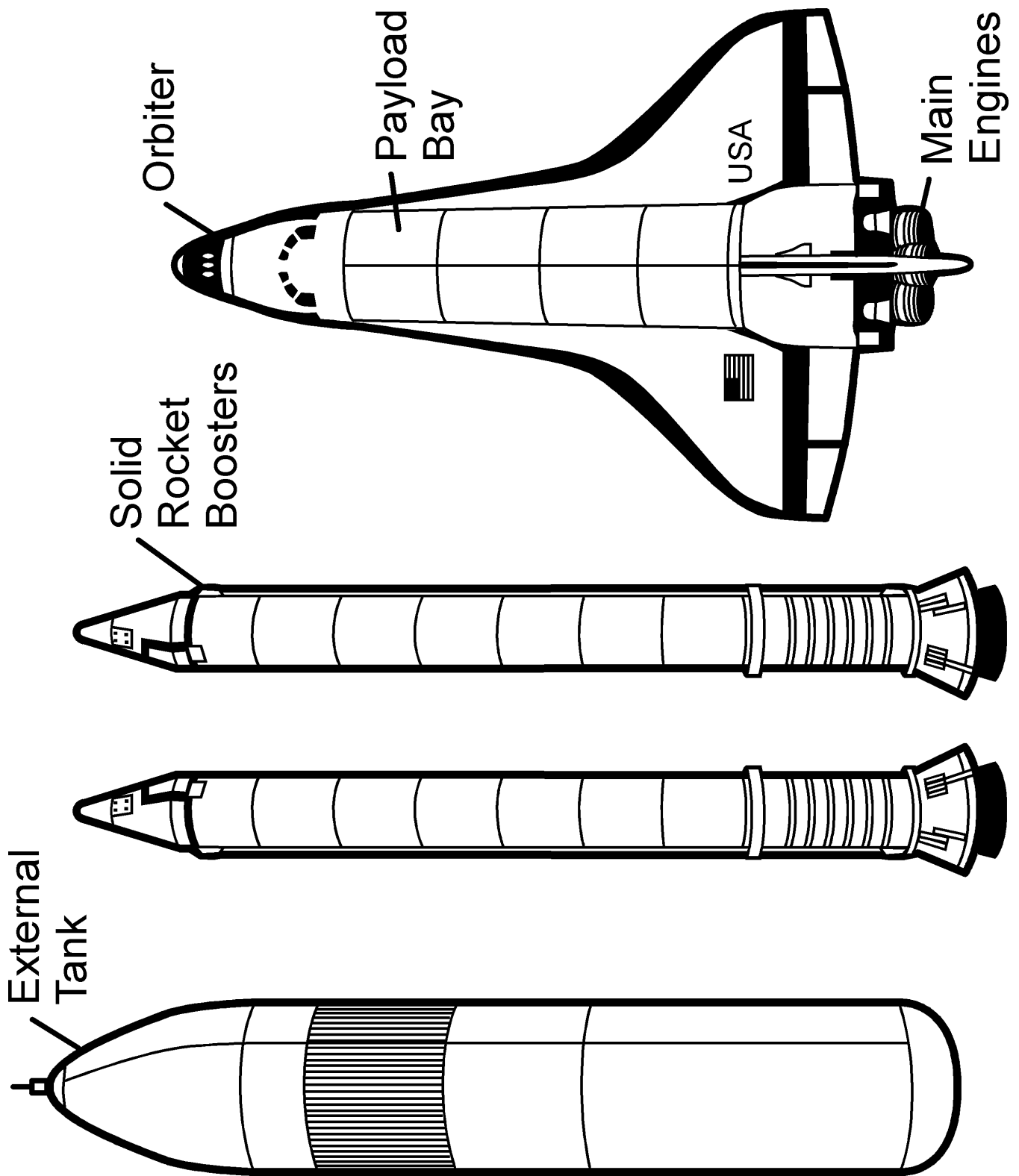


Figure 11. Space Shuttle Parts



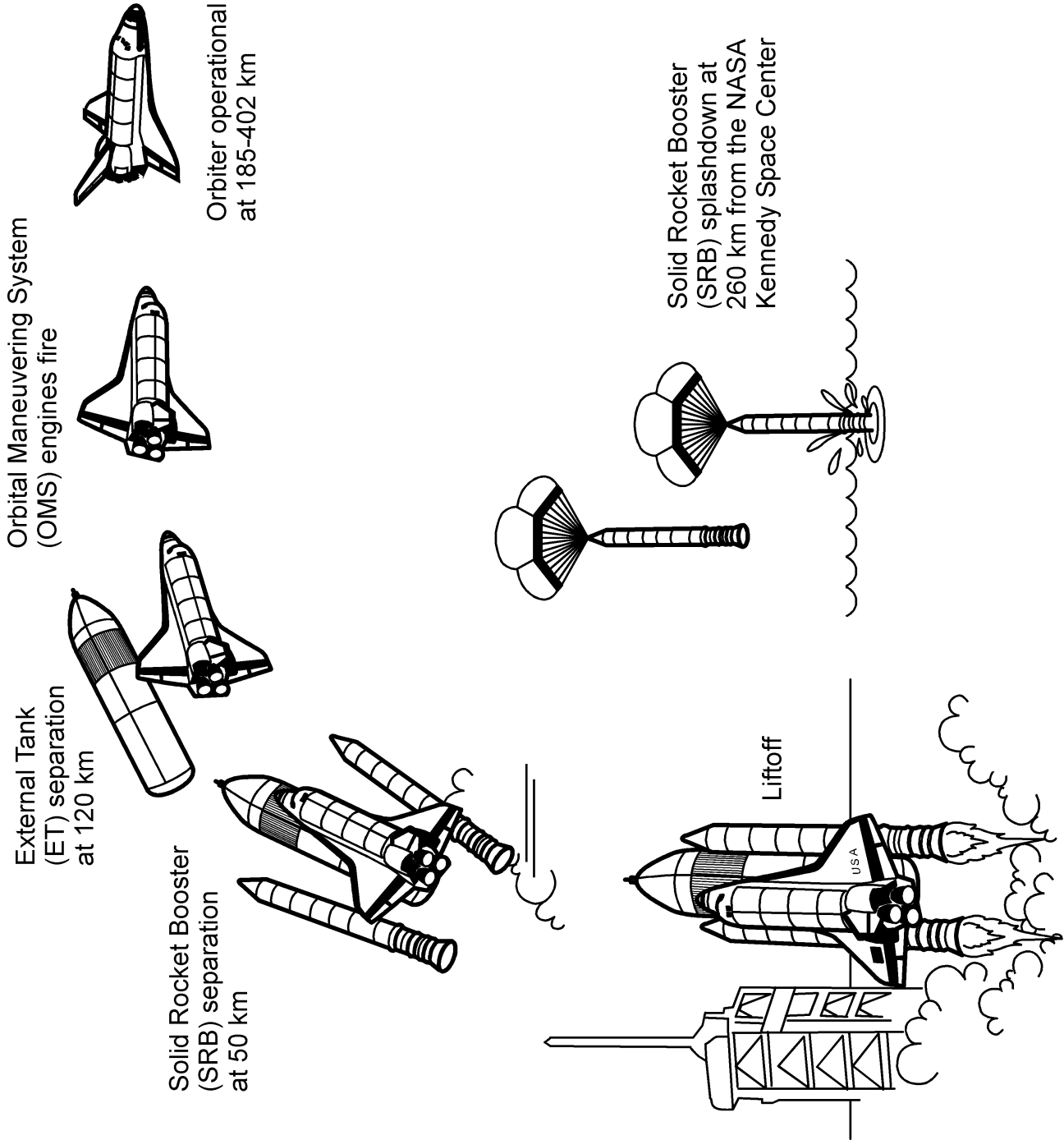
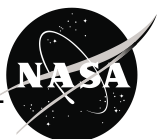


Figure 12. Shuttle Launch to Orbit Sequence



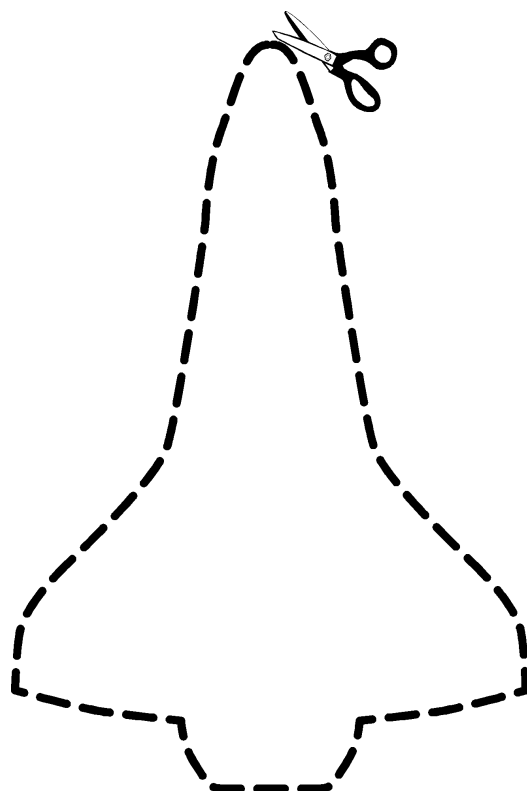


Figure 14. Orbiter Template

