

The Airport Book: Engineering Design Process

Your team of engineers will design a more efficient system for transporting luggage straight from the airplane to the conveyor belt where passengers pick up their luggage. The materials you can use to build your luggage transportation system are pictured below.

			
Craft Sticks	Paper Rolls	Straws	Masking Tape
			
Construction Paper	Notecards	String	

1) Notice that the word Ask is in one of the circles in Figure 1. Ask yourself: What materials would I like to use to build a luggage transportation system? Write these materials on your STEM Challenge handout.

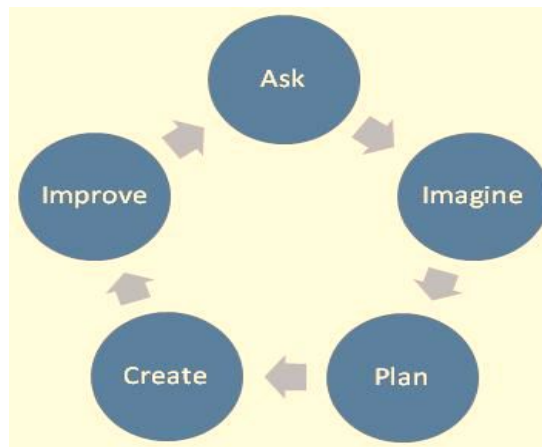
2) Notice that the word Imagine is in one of the circles in Figure 1. Imagine what your luggage transportation system will look like. Draw a picture of your luggage transportation system on your STEM Challenge handout.

3) It is time to share your ideas with your team! Put on your listening ears and, one at a time, share your ideas!

4) Notice that the word Plan is in one of the circles in Figure 1. Plan what your luggage transportation system will look like. You can use one of your teammates' ideas or a combination of the teams' ideas. But remember, you must create your luggage transportation system together as a team!

5) Draw a picture of your luggage transportation system on your STEM Challenge handout.

Figure 1: Engineering Design Process



The Airport Book: Buying Time!

It is time for you to purchase the materials for the water filter your team will build! You have \$4.00 to spend. The items and their prices are shown below.

Material	Cost per one item	Number of items your team would like to purchase	Total cost of the items your team would like to purchase
One piece of construction paper	\$0.50		
One craft stick	\$0.25		
One foot masking tape	\$0.50		
One note card	\$0.10		
One paper roll	\$0.15		
One straw	\$0.15		
Two feet of string	\$0.75		
Total Cost:			

Show your work here or on the back of this handout:

The Airport Book: Test and Improve Your Luggage Transportation System

It is finally time to test your luggage transportation system.

- 1) Did your luggage transportation system move luggage straight from the airplane to the conveyor belt where passengers pick up their luggage? Write a sentence or two about why your luggage transportation system did or did not move luggage straight from the airplane to the conveyor belt where passengers pick up their luggage.

- 2) Write a sentence or two about how you will improve your luggage transportation system.

The Airport Book: Research Time!

Use the Internet to research the following information about an airplane.

First, what type of airplane are you going to research? _____

1) How many passenger seats are in each row of the airplane? _____

2) How many rows of passenger seats are in the airplane? _____

3) Use the information you provided in questions 1 and 2 to determine the number of passenger seats on the airplane. Show your work below.

- 4) The average weight of a piece of luggage is 40 lbs.
- a) What is the weight of one passenger's luggage if the passenger has two pieces of luggage? Show your work below.
 - b) What is the weight of ten passengers' luggage if each passenger has two pieces of luggage? Show your work below.
 - c) What is the weight of twenty passengers' luggage if each passenger has two pieces of luggage? Show your work below.
 - d) What is the weight of fifty passengers' luggage if each passenger has two pieces of luggage? Show your work below.
 - e) What is the weight of one hundred passengers' luggage if each passenger has two pieces of luggage? Show your work below.
 - f) Use the number of passengers you calculated in #3 to determine the weight of all of the passengers' luggage if the airplane is completely full and each passenger has two pieces of luggage. Show your work below.

5) An airplane leaves at 8:15 am. If the flight is 2 hours and 45 minutes, what time will the airplane arrive at its destination?

6) An airplane leaves at 11:45 am. If the flight is 3 hours and 30 minutes, what time will the airplane arrive at its destination?

7) An airplane leaves at 7:20 am. If the airplane arrives at its destination at 4:00 am, how long was the flight?

8) An airplane leaves at 10:30 am. If the airplane arrives at its destination at 2:45 pm, how long was the flight?