

Name: _____

Take Flight!

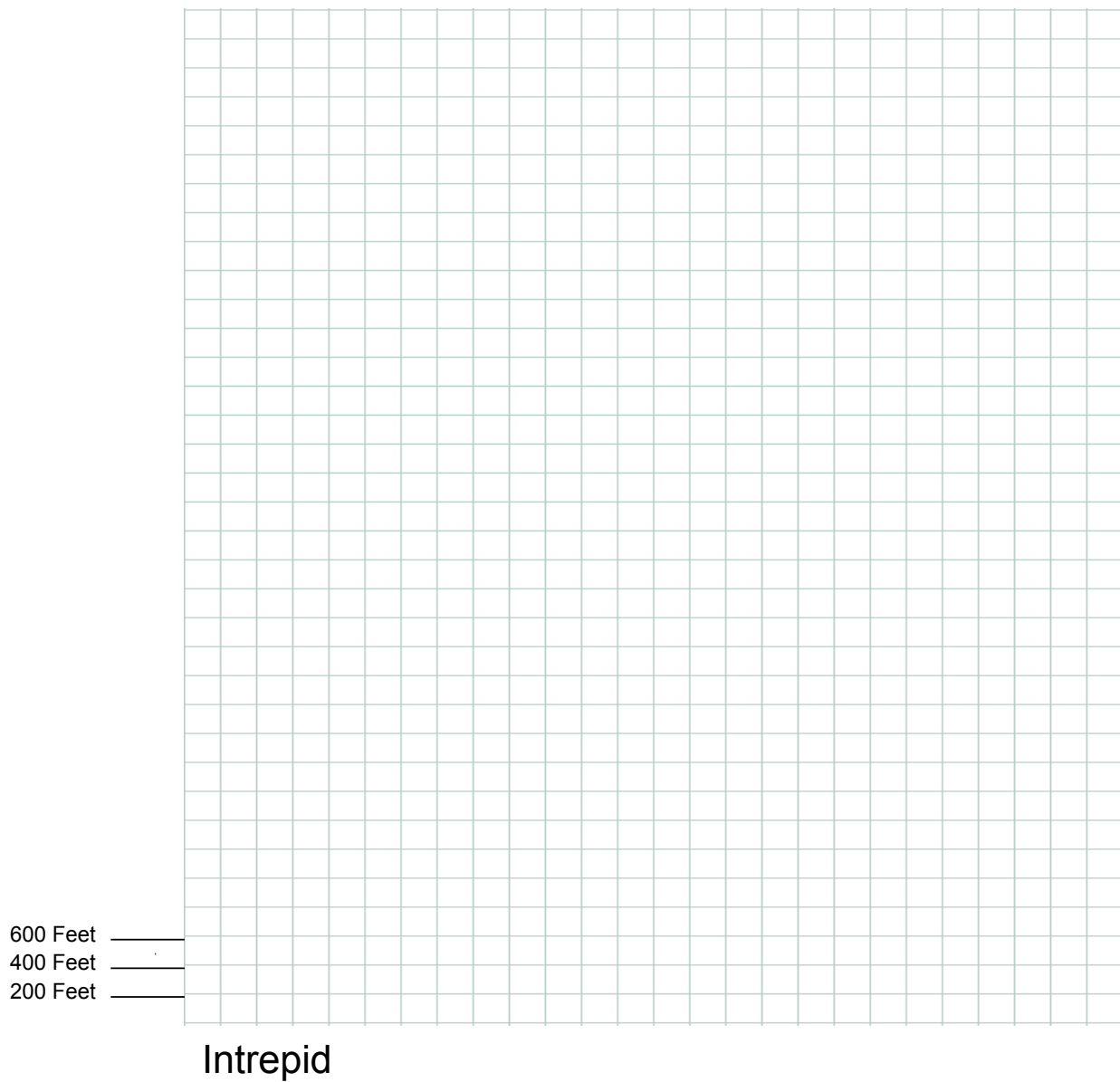


INTREPID 
SEA, AIR & SPACE MUSEUM

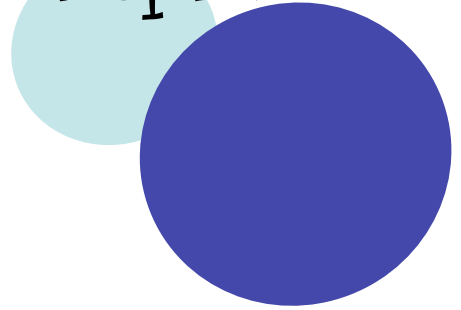
How Long is the Intrepid?

The Intrepid's Flight deck is 900 feet long. Use the graph below to chart how long that is compared to airport runways located on land!

Title: _____



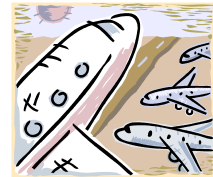
How Long is the Intrepid?



Intrepid's flight deck is _____ feet shorter than the longest runway at _____ airport.

Intrepid's flight deck is _____ feet shorter than the longest runway at _____ airport.

Intrepid's flight deck is _____ feet shorter than the longest runway at _____ airport.



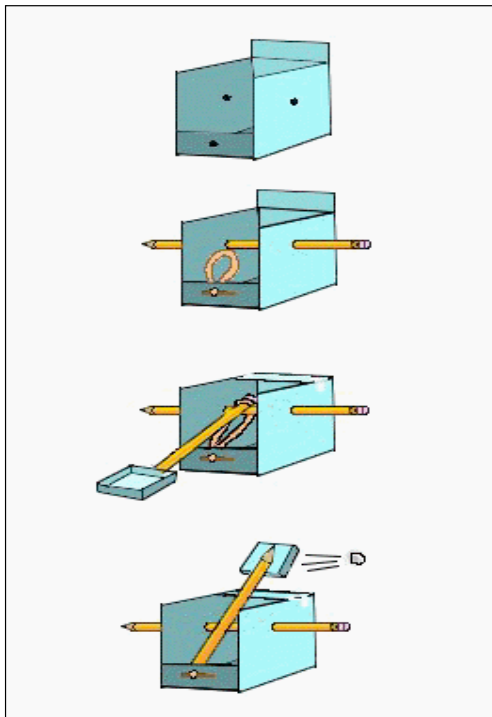
Take a guess!

What is the advantage of an airport having long runways?

Why do you think Intrepid's runway is so short compared to the runways at the airport?

Intrepid Challenge: How far can you fling it?

Follow the diagrams below to construct your catapult, making any modifications on the basic design so that your catapult will be able to launch a small crumpled piece of paper accurately to hit the designated target the distance that your teacher has specified in the “firing range” that has been established in your classroom.



1. Cut off the top of the milk carton and then cut the carton as show in diagram.
2. Cut holes the size of a pencil in both sides and in the back.
3. Push a rubber band through the hole in the back and hold it in place with a toothpick. Push a pencil through the holes in the sides.
4. Cut the tray of a match box in half lengthwise. If you don't have a matchbox make one from a 3 by 5 card and tape. Using tape, attach the box to the sharpened end of the second pencil with the pencil to the outside.
5. Select one of the three rubber bands to complete the remainder of the procedure.
6. Lay the pencil across the other with the eraser end facing the front of the catapult. Loop the rubber band over the eraser end. Fold the front flap of the milk carton inward, then crease it, and tape it down.
7. Do a trial test of your catapult to make sure it works properly. Place a small piece of crumpled paper in the holder; pull back the pencil, and then release. Make any adjustments needed, and modifications to make the catapult work better.

How Far Can You Fling It?

Record your Results!

How far did your paper travel?



Launch	Distance Traveled to Target	Success in Hitting Target (Y/N)
Trial # 1		
Trial # 2		
Trial # 3		



How Far Can You Fling It?



Let's think about what your catapult did:

What part of your catapult helped to provide thrust to your crumpled piece of paper?

_____ helped to provide thrust because

What part of your catapult helped to provide lift to your paper?

_____ helped to provide lift because

Let's think about what your paper did:

What distances did your paper go?

In Trial #1 my paper traveled _____ inches.

In Trial #2 my paper traveled _____ inches.

In Trial #3 my paper traveled _____ inches.

Did your paper go the furthest on the first, second or third trial?

_____.

Circle the statement that best describes why there could be different results for each of your trials.

- a) The crumpled paper was in a different part of the box when the catapult tossed it through the air.
- b) We pulled back either less or more on the pencil for each of the trials.
- c) It just happened that way.

Let's make some comparisons to Intrepid:

The milk/juice carton represented _____.

The pencil represented _____.

The crumpled paper represented _____.



How does shape affect the movement of an object through the air?

Drag is the force which slows down the movement of an object as it moves through the air.

Discover how the same piece of paper moves through the air when it is flat, then crumpled. Use the boxes below to record your data and answer the questions.

Flat Paper	Height	Time
Trial #1		
Trial # 2		
Trial # 3		

Crumpled Paper	Height	Time
Trial #1		
Trial # 2		
Trial # 3		

What was the average time it took for your flat paper to reach the ground? _____.

What was the average time it took for your crumpled paper to reach the ground? _____.

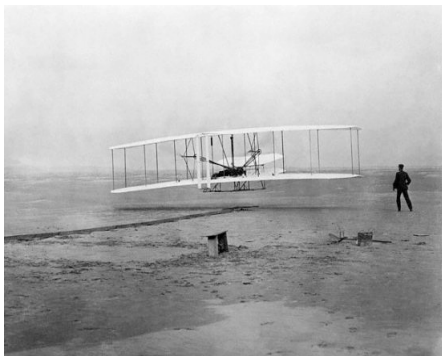
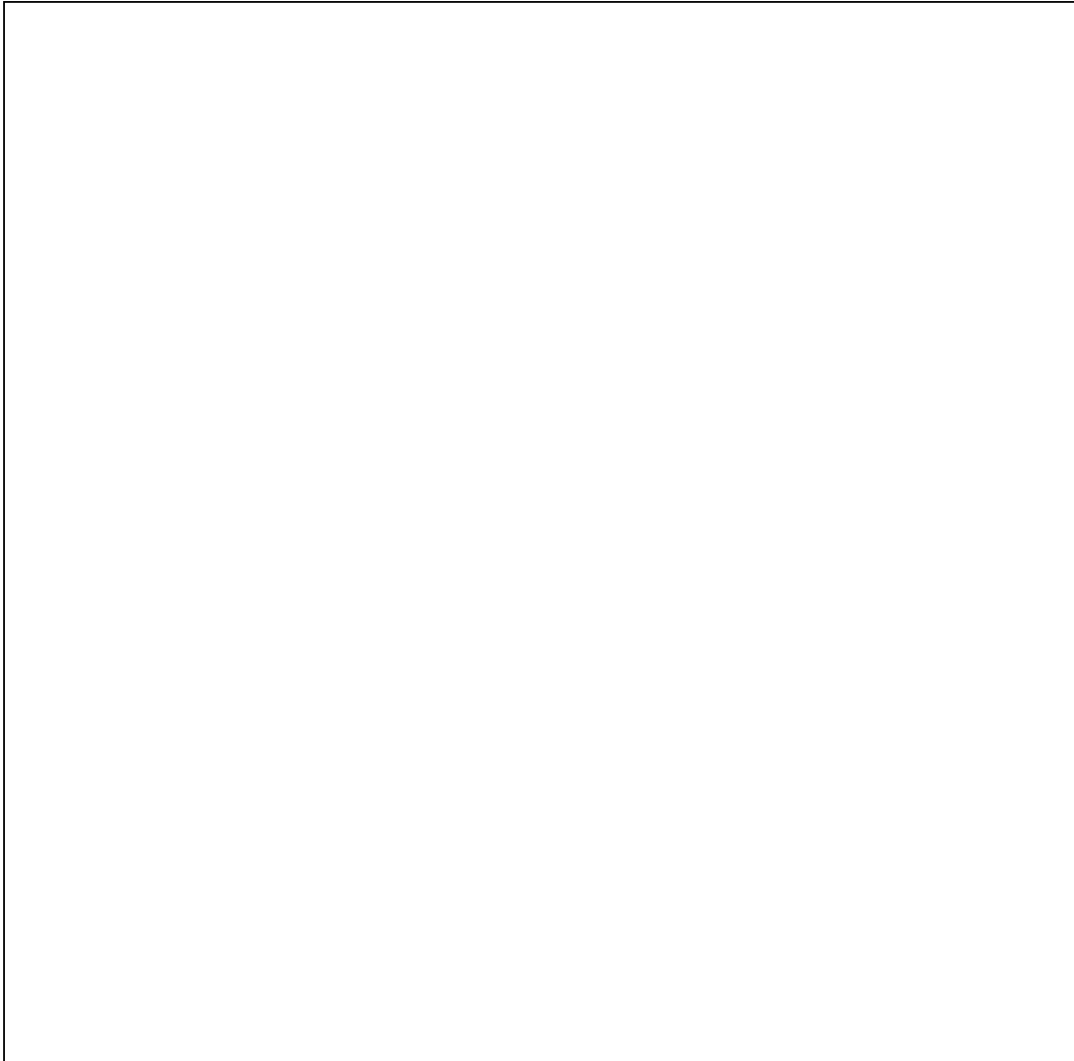
Why did the paper that was flat fall at a slower rate than the one that was crumpled?

Take a guess!

What would be a better shape to use for designing aircraft? Why?

How long has humankind wanted to Fly?

What do you think the next aviation accomplishment will be?
Use pictures and words.



The Wright Brothers flew the Flyer at Kitty Hawk, NC on December 17, 1903

It was the first powered, heavier-than-air machine to achieve controlled sustained flight with a pilot on board.

