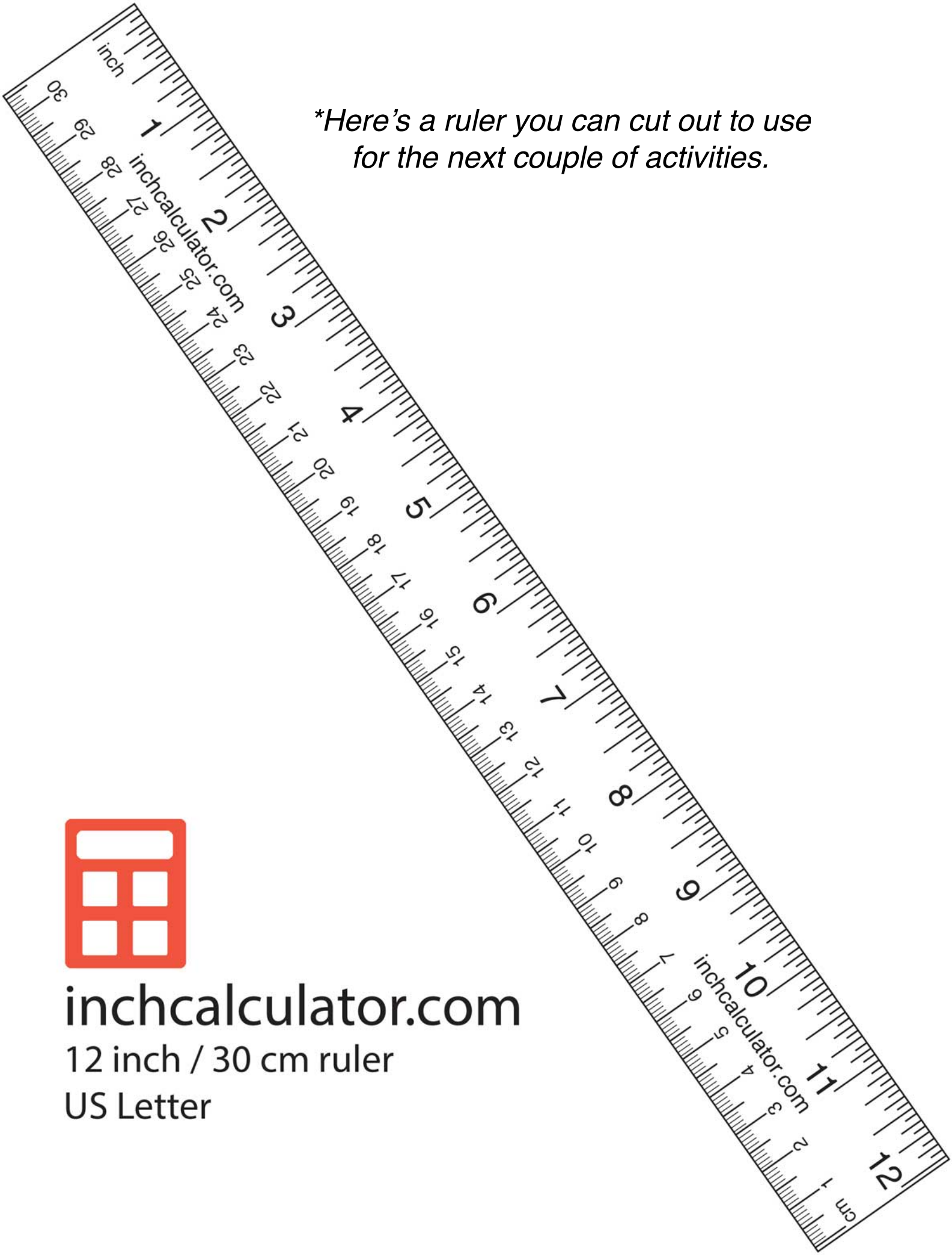
Science Packet For Week 2
April 6-10

Metric System

Prefix	Meaning	Length	Mass	Capacity
kilo-	thousand (1,000)	*kilo*meter	*kilo*gram	*kilo*liter
hecto-	hundred (100)	*hecto*meter	*hecto*gram	*hecto*liter
deka-	ten (10)	*deka*meter	*deka*gram	*deka*liter
*base unit	ones (1)	meter	gram	liter
deci-	tenths (0.1)	*deci*meter	*deci*gram	*deci*liter
centi-	hundredths (0.01)	*centi*meter	*centi*gram	*centi*liter
milli-	thousandths (0.001)	*milli*meter	*milli*gram	*milli*liter

*Here's a ruler you can cut out to use for the next couple of activities.



inchcalculator.com

12 inch / 30 cm ruler

US Letter

Length Lab ***Monday Lab 1*** Name _____

1. What does each unit represent?
   (a) mm = _____ (b) m = _____
   (c) cm = _____ (d) km = _____

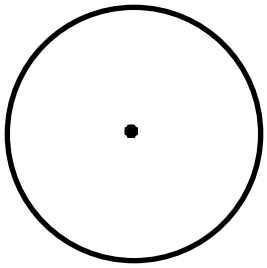
2. How much does each one equal?
   (a) 1 m = _____ cm (b) 1 cm = _____ mm (c) 1 km = _____ m

3. Which measurement is the largest? Circle your answer for each pair.
   (a) 14 mm or 1 cm (d) 145 m or 145 km
   (b) 334 m or 1 km (e) 3.4 cm or 30 mm
   (c) 1 m or 990 cm (f) 10 km or 1000 cm

4. Use a metric ruler or meter stick to find each measurement.

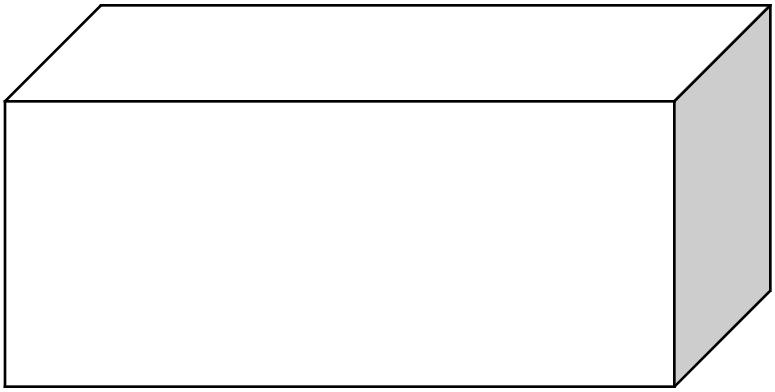
(a) Length of the line in centimeters _____
(b) Length of the line to the nearest centimeter _____

(c) Height of the rectangle to the nearest millimeter _____
(d) Width of the rectangle to the nearest millimeter _____



(e) Radius of the circle to the nearest millimeter _____
(f) Diameter of the circle in centimeters _____
(g) Diameter of the circle to the nearest centimeter _____

HINT: If it says "nearest", you need to round your answer so you don't have a decimal point. If not, you should have one decimal point in your answer.



(h) Volume of the box in cubic centimeters

_____ x _____ x _____ = _____

(Measure to the nearest centimeter before multiplying.)

5. Find the length of an unsharpened pencil (including eraser) in millimeters. _____

6. What is your height in centimeters? _____ What is your height in meters? _____

7. Find the distance between the two index cards in the hallway in meters. _____

8. Use your shoe and a metric ruler to complete this section. Keep your shoes on for this one!
   (a) What is the length of your shoe to the nearest centimeter? _____
   (b) How many shoes would it take (heel to toe) to make 1 meter? _____
   (c) How many shoes would it take to make 1 kilometer? _____

9. Use ten pennies and a metric ruler to complete this section.
   (a) How tall is a stack of ten pennies in centimeters? _____
   (b) How tall would a stack of 100 pennies be in centimeters? _____
   (c) How tall would a stack of 1000 pennies be in centimters? _____

10. Circle the BEST metric unit for each.
   (a) The length of an eyelash mm cm m km
   (b) The height of a flagpole mm cm m km
   (c) The length of a strand of spaghetti mm cm m km
   (d) The distance from Chicago, IL, to Peoria, IL. mm cm m km

Length Lab Answer Key:

1. A - millimeter, B - meter, C - centimeter, D - kilometer

2. A - 100 cm, B - 10 mm, C - 1000 m

3. A - 14 mm, B - 1 km, C - 990 cm, D - 145 km, E - 3.4 cm, F - 10 km

4. A - 14.8 cm, B - 15 cm, C - 10 mm, D - 115 mm, E - 17 mm, F - 3.4 cm, G - 3 cm

5. 9 cm x 4 cm x 2 cm = 72 cm^3

6. Answers will vary depending on pencil used.

7. Answers will vary.

8. Answers will vary.

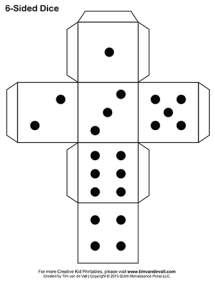
9. Answers will vary.
(Answer for B should be 10 times the answer for A. Answer for C should be 100 times the answer for A.)

10. A - mm, B - m, C - cm, D - km

NOTE: Allow ±1 mm or ± 0.1 cm on all measurements. Check measurements on actual page provided for students. There may be slight variances depending on the printer and/or copy machine settings.

*Here's a dice you can put together for the next activity.

*Or, you can write the numbers 1-6 on a small piece of paper and draw them out of a cup.



Metric Drawing

Monday Lab 2

Materials needed:

Blank paper
Metric ruler – (paper copy included in packet)
Die (singular for dice – paper copy included in packet)

Instructions:

Roll the die three times to find out which numbers to use for drawing your picture.

Roll # 1 _____ Roll #2 _____ Roll #3 x 2 = _____

Example: You roll a 3, then a 4, then a 6.
Your numbers would be 3 cm, 4 cm and 12 cm.

Make a drawing based on your three numbers. Every line in your drawing has to be one of those three lengths. All of the lines do not have to be straight. If you want to draw a curvy line, for example, you can use a piece of string or yarn or wire to measure the line and then check the distance on your ruler.

<u>*Tuesday Lab*</u> Name _____

Metric Lab Around the House

1. There are 10 millimeters in a _____. There are 100 centimeters in a meter. A centimeter is one hundredth of a _____. This is like $1.00. How many pennies make up $1.00? _____ So one penny is _____ of a dollar.

$4.65 is four dollars and 65 cents. 4.65cm is 4 meters and 65 hundredths of a meter.

2. 1m = 100 cm 2m = _____cm 500cm = _____m 600cm = _____m

2m 4cm = _____cm 1m 10cm = _____cm 82 cm = _____m

3. Measure the following to the nearest hundredth of a meter. Your answer will be in meters!!

Objects	Measurement	Objects	Measurement
Width of a piece of paper		Width of the refrigerator door handle	
Height of your tallest shoe		Length of a spoon	
Spread your hand out as far as you can and measure the length from the end of your thumb to the end of your pinky finger		Depth of a window sill	

4. Find something that has the same width and same length. _____

5. Find an object that is about the same size as 1 meter _____

6. Estimate the width of a window _____

Now measure the window _____ How close were you? _____

7. Find something in your house that is exactly 25 centimeters (or the closest you can get).

_____

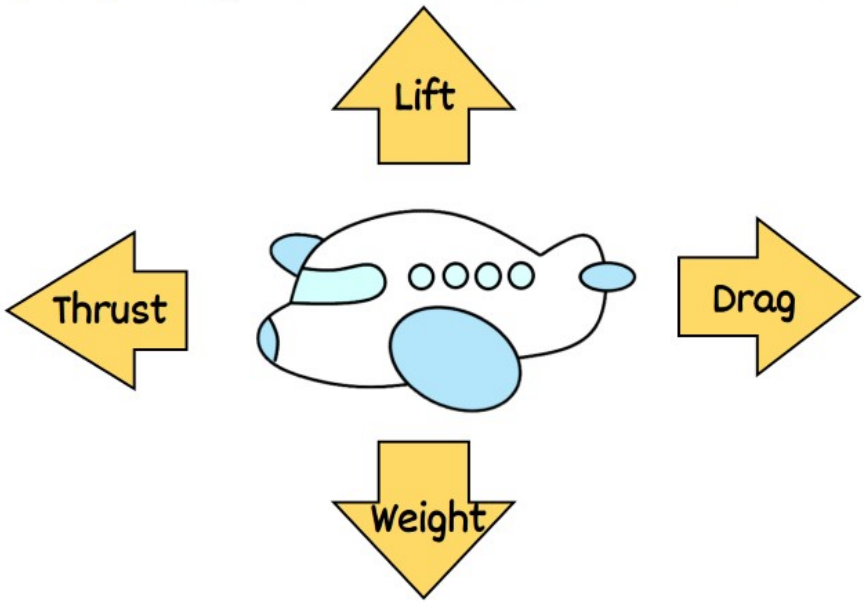
SCIENCE BACKGROUND

Wednesday & Thursday Lab

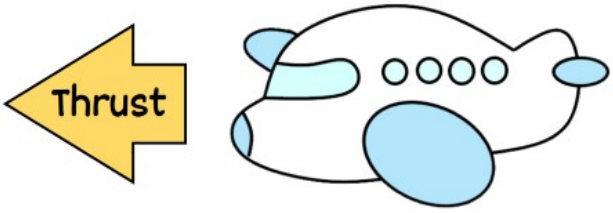
PAPER AIRPLANE

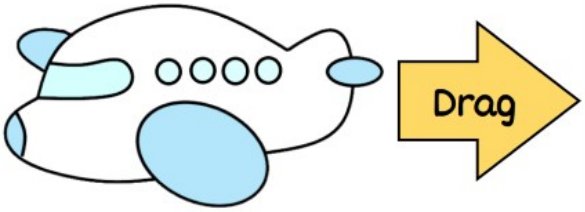
The four forces of flight:

Lift, drag, weight and thrust are the forces acting on an airplane. To maintain a steady flight requires balance of all the four forces.



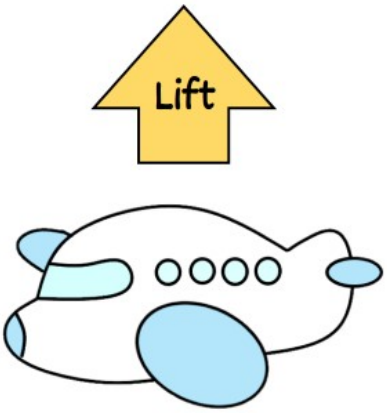
Thrust: It is the force that moves a flying machine in the direction of motion. It is created with a propeller, jet engine or rocket. Paper airplane gets its thrust from the person throwing it. So, to increase thrust, you'll need to throw it harder!

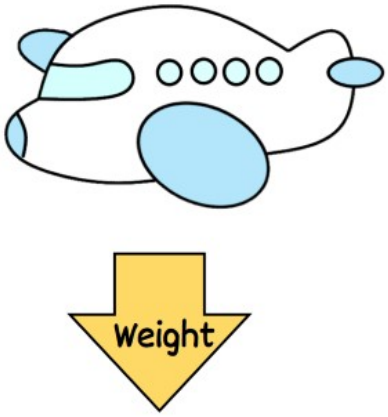




Drag: it is the force that acts opposite to the direction of motion. It tends to slow down an object. Drag is caused by friction or differences in air pressure. The front of an airplane is narrow to create less drag. The shape of the airplanes are designed in such a manner that it moves easily through the air.

Lift: It is the force that holds an airplane in the air. The wings create most of the lift used by airplane. As air travels around an airplane wing, it moves faster over the top and slower under the bottom. This creates low pressure above the wing and high pressure under the wing. This high pressure acts as a lifting force allowing the airplane to fly.





Weight: It is the force caused by gravity. It acts in downward direction towards the earth. The amount of gravitational pull is equal to how heavy or light the object is. To fly, the force of weight must be less than the force of lift. Paper airplanes that weighs less will fly farther so it must be made with a lighter paper.

NAME: _____ DATE: _____

PAPER AIRPLANE

ASK

To build a paper airplane that can fly as far as possible.

What are your ideas to build a paper airplane ?

A

B

C

D

PLAN

Which design you want to choose for building paper airplane ?

A ☐ B ☐ C ☐ D ☐

CREATE

The finished Paper Airplane looks like:

TEST

Flight	Distance travelled by plane 1	Distance travelled by Plane 2
1		
2		
3		

The longest flight distance is _____

The shortest flight distance is _____

IMPROVE

Do you think your second plane was better than the first plane? Why?

_____

_____

_____

_____

REFLECT

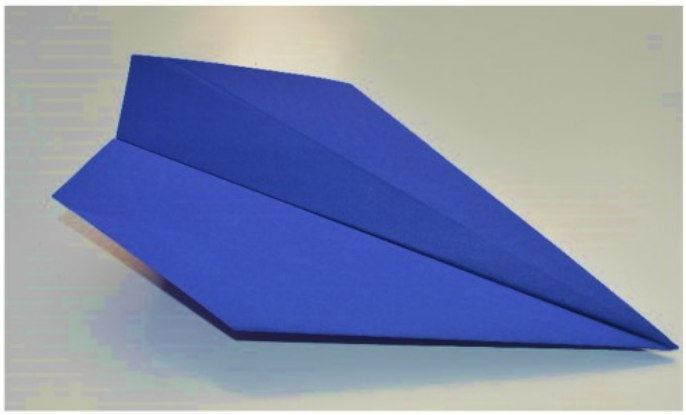
How was your experience in making Paper airplane? What worked well? What didn't work well ?

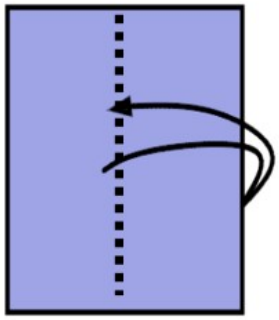
_____

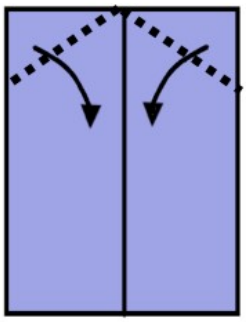
_____

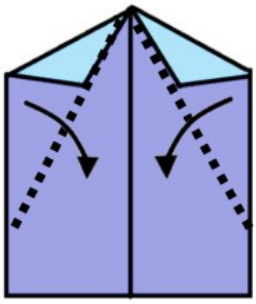
_____

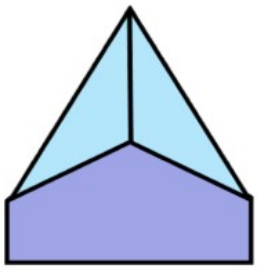
PAPER PLANE DESIGN 1

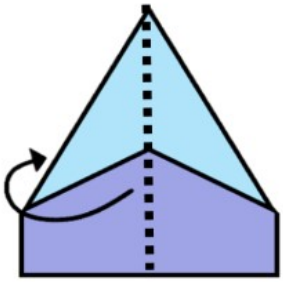


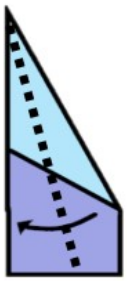












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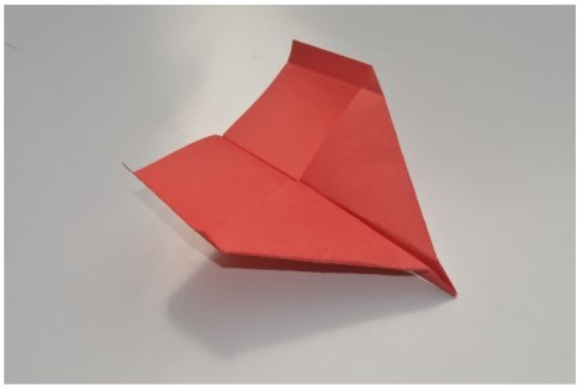
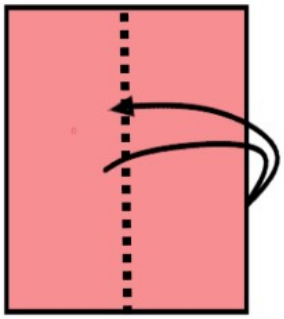
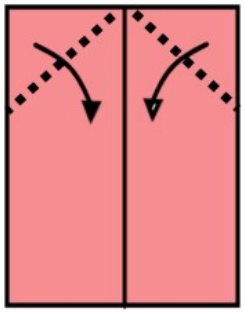
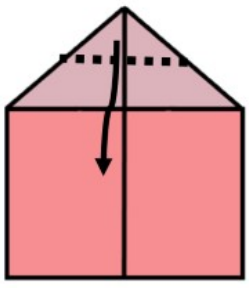
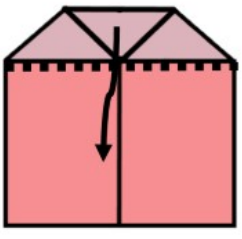
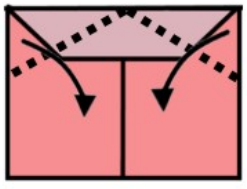


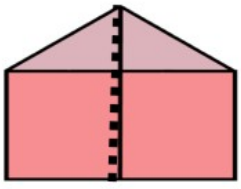


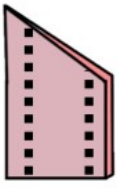




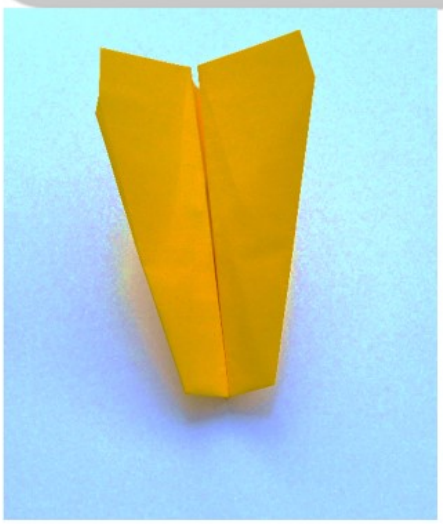


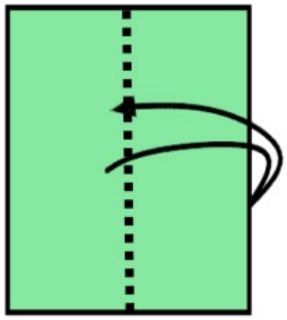


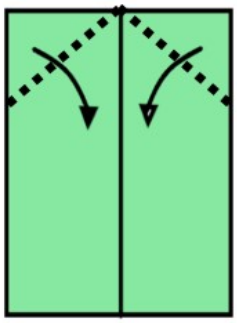


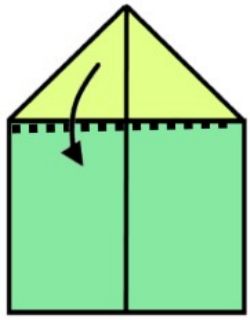


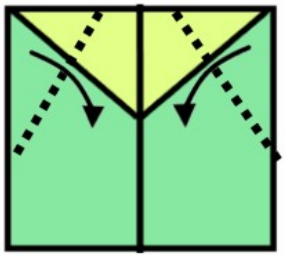
PAPER PLANE DESIGN 3

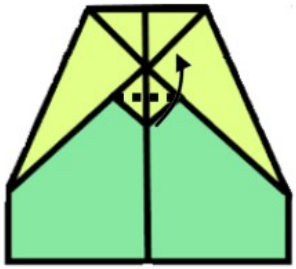


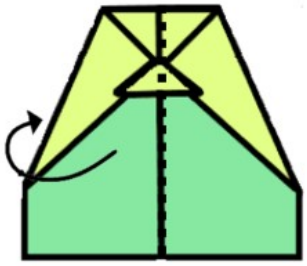


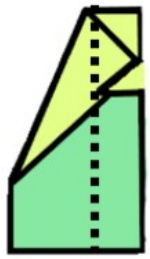












Friday Activity

Name _____

Directions

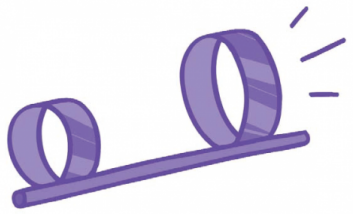
For each category listed along the left side of the page, think of an appropriate word that begins with the letter at the top of the column. The first item is done for you.

	M	E	T	R	I	C	S
Names of sports teams	Michigan Wolverines						
Action verbs							
Exercises							
Celebrities							
Names of cities							
Words relating to Science							
Names of animals							

Extra/Optional Lab

Hoop Glider

Challenge:



Can you create a hoop glider that will glide through the air? Your challenge is to create a hoop glider that contains 1 small loop, 1 large loop, and a straw. Design it to glide as far as possible!

Index cards or stiff paper
Tape
1 pair of scissors
Straws – or make a straw out of paper
markers (optional)

Make predictions:

1. What do you think would work better, a shorter straw or longer straw? Why?

2. Do you think the small hoop should be the front of your glider or the back?

Construction time:

Take a note card (or stiff paper) and cut it into thirds lengthwise. Take one strip of the note card and form a loop by overlapping the edge about 3 centimeters. Now put tape over the seam to hold it. This will be your small loop. Now take the other two strips and make one big loop the same way. Finally, tape your straw to the inside
of the loops.

Experiment:

Remember, only change one variable at a time. Experiment with changing the length of the straw, the position of the hoops, and the direction you throw the hoop glider. Get creative!! Try to throw your hoop glider as far as possible.

What forces are working against your hoop glider? Explain how the forces affect your hoop glider.

Choose one variable to test like length of straw, size of hoops, hoop position, how you throw, etc. and record the data to find out if that change made a difference in the distance flown.

Variable Changed	Distance 1	Distance 2	Distance 3	Average

To get an average, add all three distances and then divide by 3.

Can you make a claim that one variable was much better than the other? _____

If you said yes, give evidence for your claim.

If you said no, explain why.