

READ THIS WELL!

Try to Remember everything we've discussed in class over the past several weeks.

For the layout - Question & Hypothesis should always be on the left side of board

Results, Conclusion and Application should always be on right side of board (looking at board)

Try to keep Data in the middle, but if necessary it may go on the right side.

Pictures & Variables should be in middle.

If your procedure is too long, you can make the text size smaller or you may need to move it to the middle of board.

Check your white space!! Be creative in your spacing to try to minimize the white/blank space as best you can.

Be sure to leave CREATIVE title off your picture that you send me, so it remains a surprise to the class. If you are using a board "topper" be sure to fill your whole board well. If not, be sure to leave enough space for your creative title.

On the next few pages, you will see examples of excellently spaced and designed boards. Some of them may need their fonts a little larger, but overall they are great examples to give ideas on how to design your boards.

500M GOES THE TENNIS BALL

Question

At what angle does a tennis ball launcher shoot a ball the furthest?

Hypothesis

I think that the tennis ball will go the furthest at the 45-degree shot.

Procedure

1. Build a tennis ball launcher out of Pringle cans, PVC pipe, and duct tape
2. Set up the launcher at specified angles (75, 65, 45, 25, and 15 degrees)
3. Pour a little less than half a teaspoon of lighter fluid into the top of the launcher
4. Place the tennis ball in the top of the launcher
5. Shake the launcher for 20 seconds
6. Use the lighter to light a flame in the small hole in the bottom of the launcher
7. Measure and record how far each ball went
8. Repeat steps 2-7 for each angle

Material List

1. PVC pipe
2. Three empty Pringle cans
3. Duct tape
4. Lighter fluid
5. A lighter
6. Tennis balls
7. Angle measuring tool

Variables

Independent Variable:	Dependent Variable:	Controlled Variables:
• Angle	• Distance it travels	• Where it was shot from
		• Amount of lighter fluid
		• Tennis ball size & type

Results

After measuring all of the shots:
The 75-degree angle traveled 75 feet
The 65-degree angle 114 feet
The 45-degree angle traveled 271 feet
The 30-degree angle traveled 128 feet
And the 15-degree angle traveled 73 feet

Conclusion

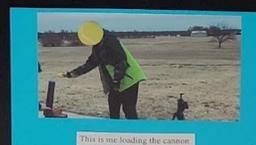
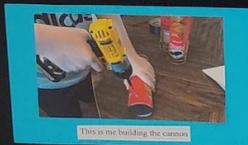
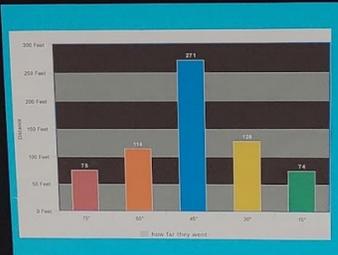
During the experiment the 45-degree angle traveled the furthest with 271 feet. The experiment worked as I hoped it would, with my hypothesis being correct. I learned that it's hard to do this experiment when it's cold and windy.

Bibliography

Gurstelle, William. "Chapter 6: The Tennis Ball Mortar." *Backyard Ballistics: Build Potato Cannons, Paper Match Rockets, Cincinnati Fire Kites, Tennis Ball Mortars and More Dynamic Devices*, Second ed., Chicago Review Press, Chicago, IL, 2012, pp. 87-98.

Application

One way the information discovered during my experiment could be used in everyday life is by the use of military cannons in warfare.



Missing the title "DATA", but overall a well designed board!

4

59%

Do BABIES Resemble Their Parents?

Question:

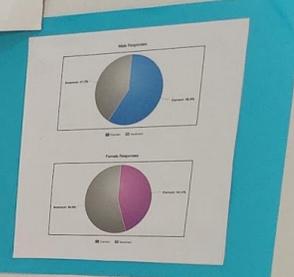
Which gender, male or female, can correctly pair one of the male babies pictured with his corresponding set of parents?

Materials:

1. Paper surveys
2. Clipboard
3. Four pictures of random babies and one picture of a baby that belongs to the parents shown on the survey.
4. People to complete the survey

Variables:

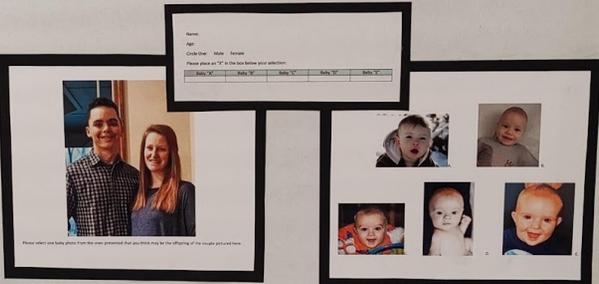
My independent variables were the pictures of the babies shown in the experiment.
My dependent variable was which gender, male or female, could best match a baby with the parents provided.



Hypothesis:

I think females will have a greater likelihood of identifying the baby correctly over males.

My reason for this hypothesis is based on the finding that women are better at seeing colors than men, according to www.colour-concepts.com/dp-women-see-more-colors-than-men/. My thought is that they will be better able to notice eye and hair color similarities between the baby and his parents.



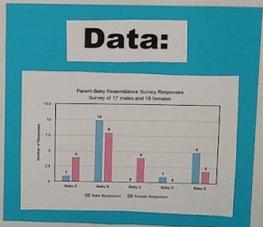
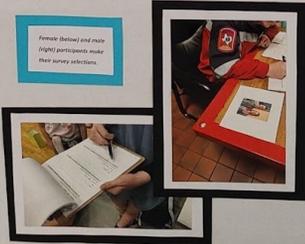
Results:

Out of all 35 respondents, over 50% chose correctly.

- 59% of males chose correctly.
- 44% of females chose correctly.
- 15% more males than females chose correctly.

Procedure:

- Survey the same number of participants from both genders.
- Ask them to identify the baby that belongs to the set of parents shown in the pictures.
- Have participants record their guesses on the survey sheet.
- Only survey people who do not know the couple or their baby.
- Analyze and record the results of the survey.



Conclusion:

My hypothesis was wrong. According to my experiment, 15 percent more males than females can correctly detect the resemblance between a baby and his parents. Also, due to the large percentage of correct guesses across both groups, my results suggest that for babies 3-6 months old, there is at least some resemblance to their parents.

Application:

My experiment relates to the real world because people often tell new parents, "Your baby looks just like you!" Making this statement may actually be a safe assumption since over 50% of all people surveyed correctly matched a baby to his parents. Based on the results, males and females feel very confident using a parent that their baby looks like them. But in the case of females, their that observation may be slightly less accurate.

Abstract

The purpose of this experiment was to determine if males and females are better at identifying a baby that belongs to a set of parents shown in a photograph. The experiment was conducted by showing participants a photograph of a man and a woman, and then showing them four different babies. One of the babies was the same man and woman, and the other three were different babies. The participants were asked to identify the baby that belonged to the man and woman. The results of the experiment showed that 59% of males and 44% of females correctly identified the baby that belonged to the man and woman. This suggests that there is at least some resemblance between a baby and his parents.

7

Question

Which temperature can you hold your breath the longest – warm or cold.

UNDER WATER

Hypothesis

I think warm water will let you hold your breath longer.

Procedure

- Person 1 sticks head in sink full of warm water.
- Time how long they can hold their breath.
- Record their time
- Repeat again with cold water.
- Do this for each person.

Materials

- Water
- Sink
- Thermometer
- Timer

Results

	57 DEGREES	95 DEGREES
Person 1	10.04 seconds	22.96 seconds
Person 2	1:00.62 seconds	1:20.27 seconds
Person 3	12.70 seconds	64.68 seconds
Person 4	14.67 seconds	16.53 seconds
Person 5	11.0 seconds	45.08 seconds

Variables

Independent- temperature of water.
Dependent – time underwater

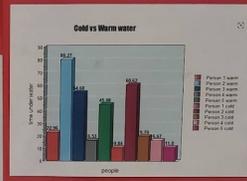
Conclusion

My experiment worked and my hypothesis was correct. You can hold your breath longer in warm water. Sudden immersion in cold water increases both your breathing and heart rate to try and generate extra heat to warm you up.

Application

Knowing that you can hold your breath longer in warmer water is helpful. If you were at the beach or the ocean and the water was cold, then you might not want to go out too far because you could run out of oxygen.

Data



Question

Which Apple watch is more accurate in counting steps, an Apple watch series 6 or an Apple watch series 3?

Hypothesis

I think the Apple watch series 6 will be more accurate in counting steps than the Apple watch series 3 because it is a newer model.

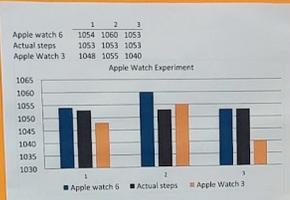
Procedure

- Helper wears both watches and count their steps
- Person walks 0.5 miles 3 different time
- Count steps with clicker app
- Record the data
- Compare results to the data of the two watches

Step

Count

Accuracy



Materials List

- Apple watch series 6
- Apple watch series 3
- One subject to walk
- Clicker app to count steps

Variables

Independent

- Distance walked
- Subject who walked
- Subject who counted steps
- Apple watch 6
- Apple watch 3

Dependent

- Number of steps recorded on the Apple watch 6
- Number of steps recorded on the Apple watch 3

Results

- 1st time:
Apple watch 6 = 1054 steps
Apple watch 3 = 1048 steps
- 2nd time:
Apple watch 6 = 1060 steps
Apple watch 3 = 1055 steps
- 3rd time:
Apple watch 6 = 1053 steps
Apple watch 3 = 1040 steps
I counted = 1053 steps avg.

Conclusion

In the experiment the Apple watch 6 was accurate 2 out of 3 times. My hypothesis proved to be correct. I learned that the Apple watch series 6 is more accurate in counting steps than the Apple watch series 3.

Application

The experiment helps others to know they can rely on their watch to accurately count steps. Both watches were close to the actual count. If you want the most accurate watch when it comes to counting steps, then buy the Apple 6.

Missing the title "DATA", but great use of filling White Space.

15

RISE AND SHINE

QUESTION

Which type of flour makes the tallest loaf of bread?

HYPOTHESIS

The bread flour will make the tallest loaf?

MATERIALS

- Active dried yeast
- Sugar
- Water
- Flour (bread, all-purpose, whole wheat)
- Salt
- Loaf pan
- Two bowls
- Wooden Spoon
- Sieve
- Towel
- Oven mitts
- Cooling rack
- Ruler

RECIPE

Flour – 3C
 Yeast – 1 ½ tsp
 Sugar – 1 tsp
 Water – 1 ½ C
 Salt – 2 tsp

VARIABLES

Independent – The types of flour used.
 Dependent – The height of each loaf.



Left: Bread flour, Middle: All purpose, Right: Whole wheat



Left: Bread flour, Middle: Whole wheat, Right: All purpose



Left: Whole wheat, Middle: Bread flour, Right: All purpose



Whole wheat flour height: Three and one eighth inches



Bread flour height: Three and one half inches



All purpose flour height: Three and one eighth inches

PROCEDURE

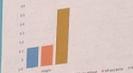
- Stir together yeast, sugar, and some of the water then leave in a warm place for 10 minutes.
- In a separate bowl, add the bread flour and salt then pour the yeast mixture and the remaining water into the middle. Stir to form a dough.
- Knead the dough for 10 minutes. Place the dough back in the bowl, cover with

the towel, and leave in a warm place for an hour.

- Preheat the oven to 425 Fahrenheit. Punch down the dough then knead it again.
- Place the dough in the pan, cover with the towel, and let it rise in a warm place for 30 minutes.
- Remove the towel and bake for 30 minutes.
- Let it rest on the cooling rack and measure the height.
- Repeat with the other flours.

RESULTS

Bread Height



DATA

Flour type	Whole Wheat	All-purpose	Bread
Height (in)	3.125	3.125	3.5
Width (in)	4.25	4.25	4.25
Length (in)	8.25	8.25	8.25
Weight (lbs)	1.268	1.459	1.433

CONCLUSION

Three different types of flour were experimented with to find out which creates the tallest loaf of bread. While the whole wheat and all-purpose had the same results, the bread flour was the tallest. This data supports the hypothesis. Bread flour does rise the most.

APPLICATION

This experiment will help take a small amount of work out of baking. Now people can know, without having to perform an experiment themselves, which kind of flour to use for the tallest bread.

ABSTRACT

For my project, the question I am asking is "Which type of flour makes the tallest loaf of bread?" In my experiment I

is that when baking bread for its height, the best kind of flour to use is bread flour. The procedure is simply to follow a certain bread recipe three times, changing only the flour.

Question

Is expensive nail polish worth the price?

Polish

Pricey

Quality

VS.

Price

Application

What you can relate to this experiment is, you don't always have to buy the expensive polish to make your nails look amazing. Go cheaper, and look better for a shorter amount of time, or go expensive and look better for a longer amount of time. Do what suits you best!

Question

Hypothesis

Materials

Procedure

Hypothesis

I think the cheaper nail polish will stay on longer but will chip and peel more. The color will be good and clear at first but will probably fade out as it stays on longer with wear.

The more expensive will probably look prettier and will not chip and peel as much as the cheaper polish. But it will probably not last as long as the cheaper polish. Since it was supposed to look prettier and glossier, it will. But it probably will not last as long.

Procedure

- I have picked out an even number of sets of polish. For example, two different brands of cheaper polish and two different brands of more expensive polish.
- Every set of polish has been taken off by nail polish remover on the third day. I have taken pictures every day for three days total for every set.
- I did not use a gel LED light for any of the sets of nail polish.

Materials

- Nail Polish
- A Hand
- Paper Towels
- Nail Polish Remover

Variables

My dependent variable was that the difference in the cheaper and expensive was that the polish was made with the same ingredients, but the more expensive had a deeper color, but was a thinner polish.

My independent variable was that I picked two cheaper brands of nail polish, and two expensive.



Results

In the end of the experiment, the cheaper polish stayed on longer, but chipped faster.

The more expensive polish stayed on a shorter amount of time but did not chip and peel as fast.

The results of this experiment was that my hypothesis was correct.

Conclusion

At the end of this experiment, my hypothesis was right. What I learned was that the cheaper polish stayed on longer but chipped faster. The more expensive polish stayed on a shorter amount of time but did not chip and peel as fast.

Bibliography

<https://www.gomastercard.com/4822281203870025>
<https://www.americanexpress.com/487293938660/>
<https://www.americanexpress.com/48338743425632/>
<https://www.americanexpress.com/4848181102402170/>
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Excellent design and layout, BUT they are missing their DATA graph.

15

FOR FIFTEEN

Question

Will a 15 minute walk a day for 15 days decrease your resting heart rate, and how long does it take for your resting heart to fluctuate?

Hypothesis

I think my resting heart rate will decrease from 62 beats per minute (BPM) to 56 BPM with a 15 minute walk over a period of 15 days. I think the consistent exercise will lower my resting heart rate more than everyday life.

Materials

- Fitness Tracker with Heart Monitor
- Stopwatch
- Tennis Shoes
- Walking Path
- Pencil and Paper to Record Results

Procedure

1. Commit to a 15 minute outdoor walk for 15 straight days. (if there is inclement weather, consider walking inside.)
2. Record resting heart rate daily at the same time. (before bedtime is best.)
3. Tally results and compare to the previous days.

Variables

Independent Variable:

1. Resting Heart Rate

Dependent Variables:

1. Time walked
2. Walking speed
3. Route
4. Weather
5. Amount of sleep
6. Medication
7. Diet



Data



DAY	HR	DAY	HR
1	62	8	61
2	61	9	62
3	60	11	59
4	60	12	58
5	61	13	57
6	62	14	56
7	61	15	55

Results

My hypothesis was incorrect. My experiment had many spikes varying from 55 BPM to 72 BPM, but in the end my resting heart rate remained the same as when I started (62 BPM). On day seven, my resting heart rate dropped 3 bpm, but on day eleven, my resting heart rate increased drastically by 13 BPM. In conclusion, a 15 minute walk for 15 days does not result in a lower resting heart rate, but it does cause fluctuations.

Conclusion

In conclusion, my results were somewhat unexpected. I anticipated a lower resting heart rate, but in the end, despite fluctuations, my heart rate remained the same (62 BPM). This experiment was a great reason for me to go outside and get some additional exercise.

Application

This experiment did not lesser my resting heart rate. But it did force me go outside and be active. Sometimes it's good to do when you wake up so you can start the day with good energy.

They forgot captions under pictures, but this is a great example of design and placement.