

Are Squirrels Scared of Bells?

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Background info

Yiding has a peach tree in his backyard. Last year, there was one peach on the tree and it got taken off the tree by squirrels before it was ripe. This year, we expect there will be a lot more peaches. We want to protect them from getting eaten by squirrels.



Questions & Brainstorming

Q1: How can we keep squirrels away from our peaches?

We need to find the answer to the following questions first.

Q2: What are squirrels scared of?

We did some research about squirrels online.

<https://www.worldbookonline.com/>

The website provides a lot about the life of squirrels but nothing about what squirrels are scared of.

We notice that when we make a sound without the squirrels noticing us, they run away. Maybe we can use bells to make sound to scare away squirrels.

Q3: Are squirrels scared of bells?

Hypothesis

- **Squirrels are afraid of bells.**

Possible reasons squirrels might be afraid of bells:

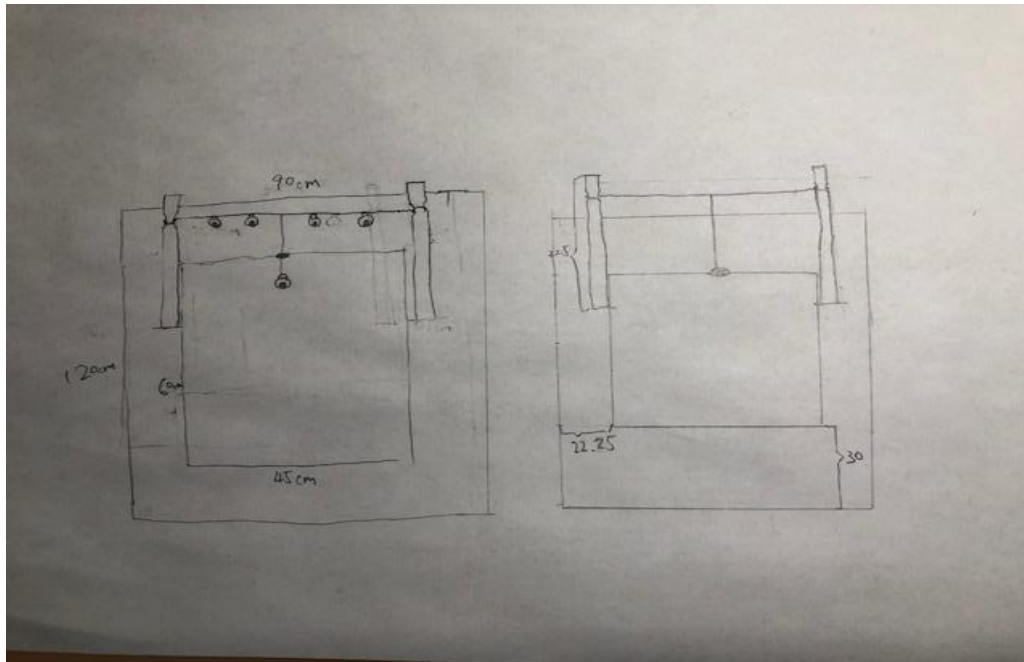
- Sound
- Light (as in reflection)
- Shape



Experimental Designs

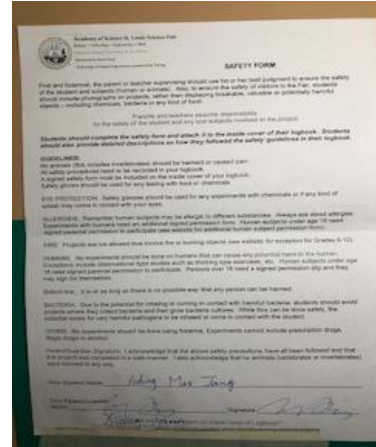
- **How do we attract squirrels?** By using the right bait, e.g. cheese, nuts and flowers.
- **How do we make sure if a squirrel came or not?** By setting up the experiment on a surface with paint. We can use the footprint on the surface to decide it.
- **If the bait is not taken, how do we know that the bells are the reason?** We can have two sets parallel to each other to compare them. One set has bells, the other does not.
- **How do we know the reasons squirrels are not afraid of bells?** We do the experiment at both night and day.

Sketch of the device



Safety

1. Do not attempt to harm or kill any animals, In particular, use safe bait.
2. Bring and wear gloves and protection clothing to keep safe from animals.



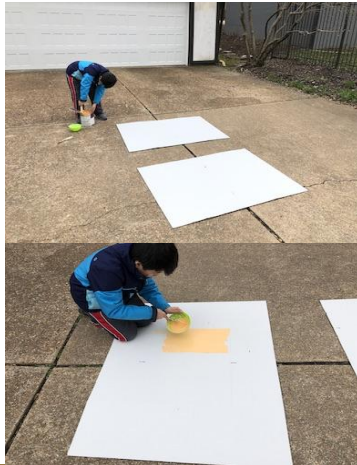
Preparation 1

On 3/15/2020 morning, we made the bait devices and baited them with string cheese.



Preparation 2

3/15/2020: We finished setting up the white boards by 12:38 pm in the middle of Yiding's driveway in the backyard. The first experiment is ready.



Experiment 1

03/15/20, 12:38, we started experiment 1.

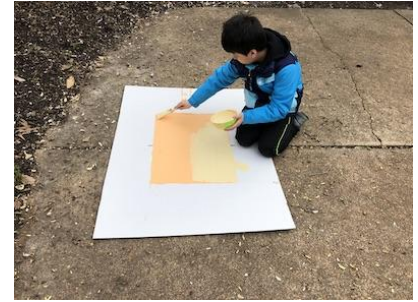
03/15/20 19:22, we completed the observation.

Both boards were untouched.

Reflection: Possibly why squirrels did not come: 1, Low temperature 2, Un-natural bait 3, Paint color (Orange)



Experiment 2



3/17/20. 10:51 We started experiment 2. We changed the paint color to grey, the cheese bait to flower bait and moved the sets closer to the boundary of the driveway.

3/17/20. 19:04. We completed the observations.

Everything is still untouched.

Reflection: Possibly why squirrels did not come: 1, Smell of paint 2, Color of the paint and paperboard 3, Bait



Experiment 3



3/17/20. 19:09. We re-planted the bait device in experiment 2 to the dirt closer to the animals.



3/18/20 8:51 We checked the re-planted bait devices. There's no change.



3/18/20 19:05. We completed the observation.

The device without bells was tugged. The other device with bells was untouched.

Reflection: How do we know it's a squirrel? Only squirrels eat flowers in our backyard.

Experiment 4



3/22/20 17:05. We started experiment 4 with the same set up as experiment 3.

We checked the sets in the morning of 03/23/20, evening of 03/23/20, and the morning of 03/24/20. Nothing changed.



3/24/20 7:30. We completed the observations. During the day time of 3/24/20 the bait on the device without bells was half eaten. The device with bells was untouched. Reflection: Two experiments have shown that the squirrels prefer the sets without bells. But why? Shape, reflection or sound? We will test it once more.

Experiment 5



3/24/20 19:50. We started experiment 5 with flower bait. We want to see if there will be a difference between day and night.



We checked the sets in the morning of 03/25/20, evening of 03/25/20, and the morning of 03/26/20. Nothing changed.

At 3/26/20 19:00, we observed the device without bells was pulled, the other was untouched.



3/27/20 7:00. We completed the observations. The bait on the device with bells was gone. The other device was also tugged.

We completed all 5 experiments. There is no more time for any more experiments. It's time to analyse our data.

Data Summary

	Exp. 1	Exp. 2	Exp. 3	Exp. 4	Exp. 5
With bells	x	x	✓	✓	✓
Without bells	x	x	x	x	✓
Day/night	Day	Day	Day	Day	Night
Concrete/dirt	Concrete	Concrete	Dirt	Dirt	Dirt

Analysis and Conclusion

1. Experiment 1&2 failed probably because of bait, location, colors and smell of the paints.
2. Experiments 3-5 prove that squirrels prefer the baits on the device without bells during the day.
3. Experiment 5 showed a sign that maybe the sound of the bells do not affect the squirrels. But more experiments are needed to prove this.

Over all, our experiments show that squirrels are afraid of bells.

This summer we
will put bells on
Yiding's tree to
protect our
peaches.



References

1. Wikihow <https://www.wikihow.com/Main-Page>
2. World book encyclopedia <https://www.worldbookonline.com/wb/Login?ed=wb>
3. Wikipedia <https://www.wikipedia.org/>

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