relationship between the angle of propellers and the falling objects.

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Team 07

1.Introduction

These days, propellers are used in many ways. For example, airplane, helicopter, drone and so on. Propellers can make objects rise and it also can change the wind to energy. We assumed that propellers can drop objects accurately. So we want to research about what propellers are best for what situation.

Figure1: Wind turbine

2.Purpose

Find a propeller in accord with a use. So we decided to drop the object.

3.Method

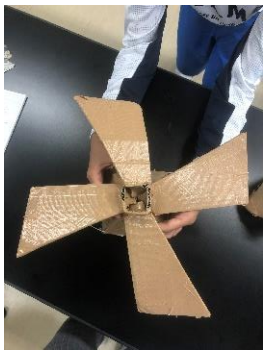
•Materials

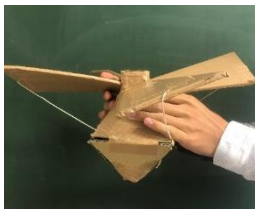
We decided to use only card board and packing tape to make figure of the device .This is because that material is not expensive and very light .And we advance the experiment more efficiently.

- ・card board
- ・packing tape
- ・oily clay

•Method

We make the device of the regular octahedron which is a falling device with a cardboard. We fixed four pieces of wings (propeller) to the device by 15 degrees, 30 degrees, 45 degrees. We observed dropping time and the number of spin.





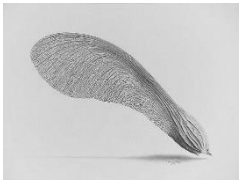


Figure2:Picture of device.

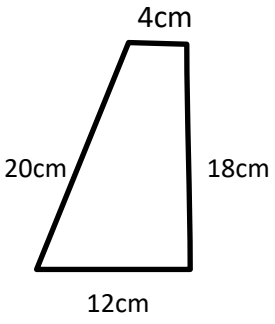


Figure3:Shape of a propeller

• Preliminary experiment

We dropped each device from 9 meters height from the ground.

At first ,we only drop the device without any weight. But some devices could not keep the balance. We assumed that the lightness of the device causes this result.

We put a weight inside the device. The weight is 250 gram made of oily clay. We decided to let a sense of stability of the body increase.

We put a weight inside of a devices.

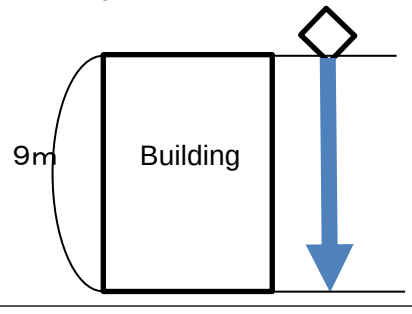


Figure4:Height

4.Results

The results are as follows.

Table1:time

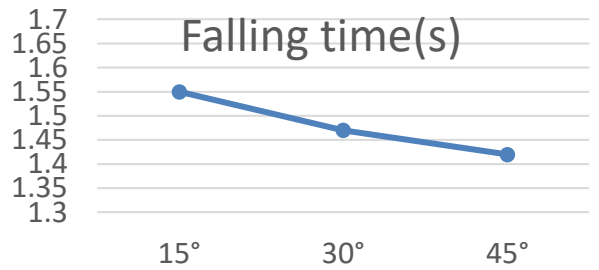
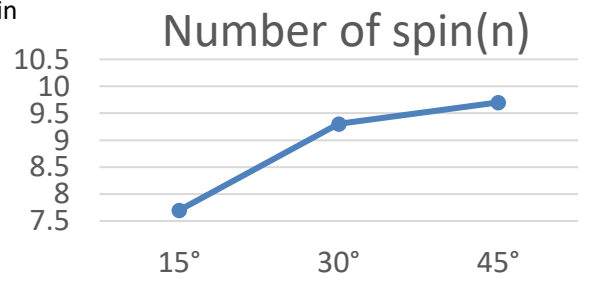


Table2:spin



All results are the average from 3 experiment each.

5.Discussion/Conclusion

As propellers angle increases, average falling time decreases.

As propellers angle increases, the average number of spin increases.

We consider that device with small wing angle receive more air resistance than big angle one. And propellers angle increases the air resistance from below is most likely to change to rotational force. So small angle device is good for dropping the device stably and big angle device is good for a situation that need a lot of rotation.

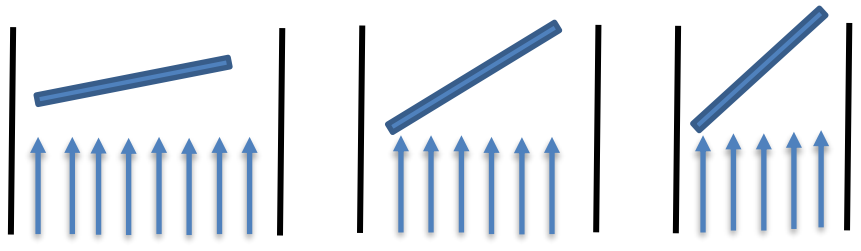


Figure5: air resistance

6.Future work

In the future, we will research the condition of falling the device when propellers angle is smaller than 15°.

In the experiment, we researched the falling device's speed. So next time, we will be focused on the propellers speed of rotations.

We will research why the higher angle device was less stability.

References

https://core.ac.uk/download/pdf/71914317.pdf