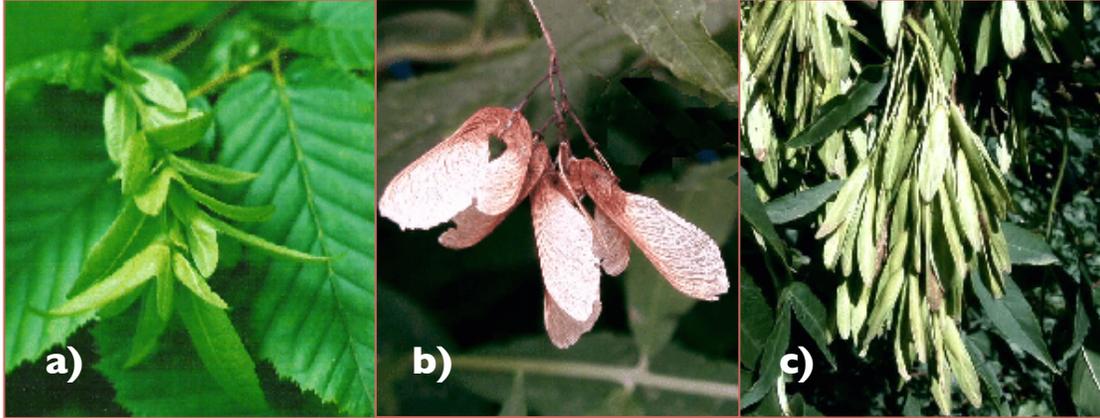


Name:

# Adaptive Aviators (Teacher Version)

## Flying Seeds

Some trees produce seeds with stiff wings that allow them to glide long distances. The wings are slightly twisted or balanced so that the seed spins as it glides to the ground. The following images depict Hornbeam, Sycamore, and Ash tree seeds. Describe 2 characteristics you notice about them that might help them fly.



- a) Tree Name: **Hornbeam**; Characteristics: *Long tails catch the wind, weight from seeds provides turn.*
- b) Tree Name: **Sycamore**; Characteristics: *Feathery tails, weight from double seeds.*
- c) Tree Name: **Ash**; Characteristics: *Long slender tails, some thickness like an airplane wing.*

## Twisting & Turning

### Materials:

- Scissors
- Paper clips
- Crayons
- Spinner Pattern



### Instructions:

1. Cut, colour and fold the spinners.
2. Place a paperclip at the end of your spinners to keep the folds in place.
3. Drop the spinners from a height, either inside or outside on a play structure (if possible). Describe the motion of the spinners, using proper vocabulary for movement:

### Follow-Up:

1. Why do the spinners fall in the first place, since they are so light? *The force of gravity pulled the spinner to the ground.*
2. Did the spinners move to the side? Why would they? *The moving air could have pushed the spinners as well.*
3. What other things are pulled to the ground in a similar way? *Maple keys are a common example.*
4. Why is it important for maple keys and other “twisting and turning” seeds to catch the wind? *So the seeds can be transported far enough from the parent tree to grow healthy and have its own space and resources.*



Name: \_\_\_\_\_

## Windy Wanderers

There are other ways that plants have adapted in terms of dispersing their seeds: some have seeds that drift in the wind (rather than flying/gliding), and some whose seeds are simply released from their pods by the wind bending their stalks.

Can you match the pictures to the type of plant, and determined whether or not it is a **drifting** or **pod** seed? The possible names are: Willow Herb, Bulrush, Columbine, Dandelion, Poppy, and Evening Primrose.



Name:  
*Bulrush*

Name:  
*Columbine*

Name:  
*Willow Herb*

Name:  
*Evening Primrose*

Name:  
*Dandelion*

Name:  
*Poppy*

Type:  
*Drifting / Pod*

## Air & Ability

There are properties of air that make flight possible for these seeds as well as for birds and man-made objects like planes. Circle the properties of air listed below if you think they contribute to how an object flies:

**Air has mass**

**Air can compress**

**Air can expand**

**Air is clear**

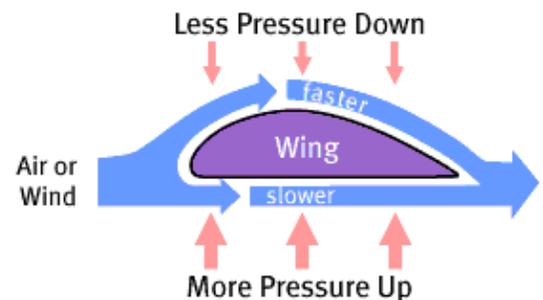
**Air is breathed in by plants and animals**



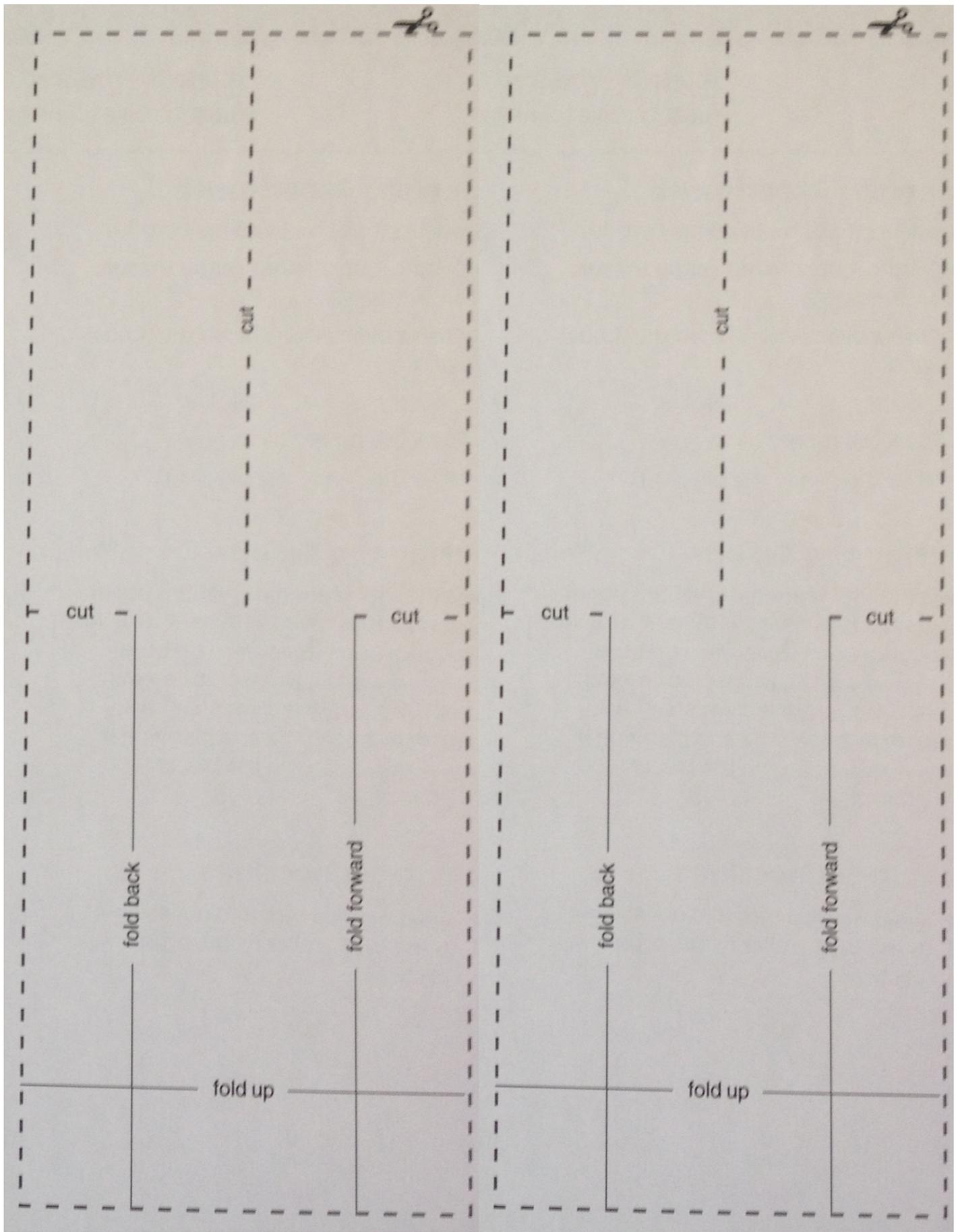
## Bernoulli's Principle

According to Bernoulli's Principle, the fast-moving air on top of a wing causes an area of low pressure to develop. The slower moving air on the bottom of a wing has higher pressure instead. When this happens, the area of high pressure under the wing rushes up to fill the area of low pressure above, providing lift. Look at your choices above and provide a reason for why they help a wing to fly.

*Air needs mass to force the wing up; Air has to be able to compress/expand to provide more/less pressure*



Name: \_\_\_\_\_



Name:

## **Image Sources:**

### **Flying Seeds:**

1. The Seed Site: <http://theseedsite.co.uk/sdwind.html>

### **Twisting and Turning:**

1. Fiskars: <http://www2.fiskars.com/Sewing-Quilting/Products/Scissors-and-Sharpener/Micro-Tip-Scissors-No.-5#.U4uqrxazuf8>
2. University of Hawaii: [https://epay.hawaii.edu:8443/C24372test\\_ustores/web/product\\_detail.jsp?PRODUCTID=191](https://epay.hawaii.edu:8443/C24372test_ustores/web/product_detail.jsp?PRODUCTID=191)
3. Crayons Roleplay: <http://crayons-roleplay.weebly.com>

### **Follow-Up:**

1. Wedding Bee: <http://boards.weddingbee.com/topic/whirlybirds-aka-maple-seed-pods/>

### **Windy Wanderers:**

1. The Seed Site: <http://theseedsite.co.uk/sdwind.html>

### **Air & Ability:**

1. Amber Green Energy: <http://www.ambergreenenergy.co.uk/wind-turbines-power-generation/>

### **Bernoulli's Principle:**

1. Info Use: <http://infouse.com/planemath/activities/pmenterprises/forces/forces4.html>