



## **Animal Signs/Winter Seedheads - Activity 4: Through the Seasons**

Things don't always look the same through the seasons, that includes animal signs! This activity is meant to get students thinking about and understanding these changes.

### **Goals**

- Describe how things in nature change through the seasons
- Understand how things interact with its environment through the seasons
- Identify some animal signs or winter seedheads

### **Material**

- Worksheet
- Writing utensil

### **Activity**

Things out in nature are constantly changing to deal with the different seasons and weather conditions. Just think of your own backyard or schoolyard! Does it always look the same? No! For this activity, students will be asked to draw out the changes that happen over the seasons relating to an animal sign or winter seedhead plant. This will be a sort of picture timeline!

Depending on the student's age group, this activity can be modified to be harder or easier. For older age groups that may want a bit more of a challenge, allow them to pick their own animal/plant off of the biodiversity sheet. They can then research the organism they choose to find out what happens each season before illustrating it. For the younger groups, you can choose to read over one of the outlined organisms (below) together to learn how it changes. They can then draw this out.

#### *Goldenrod Ball Gall:*

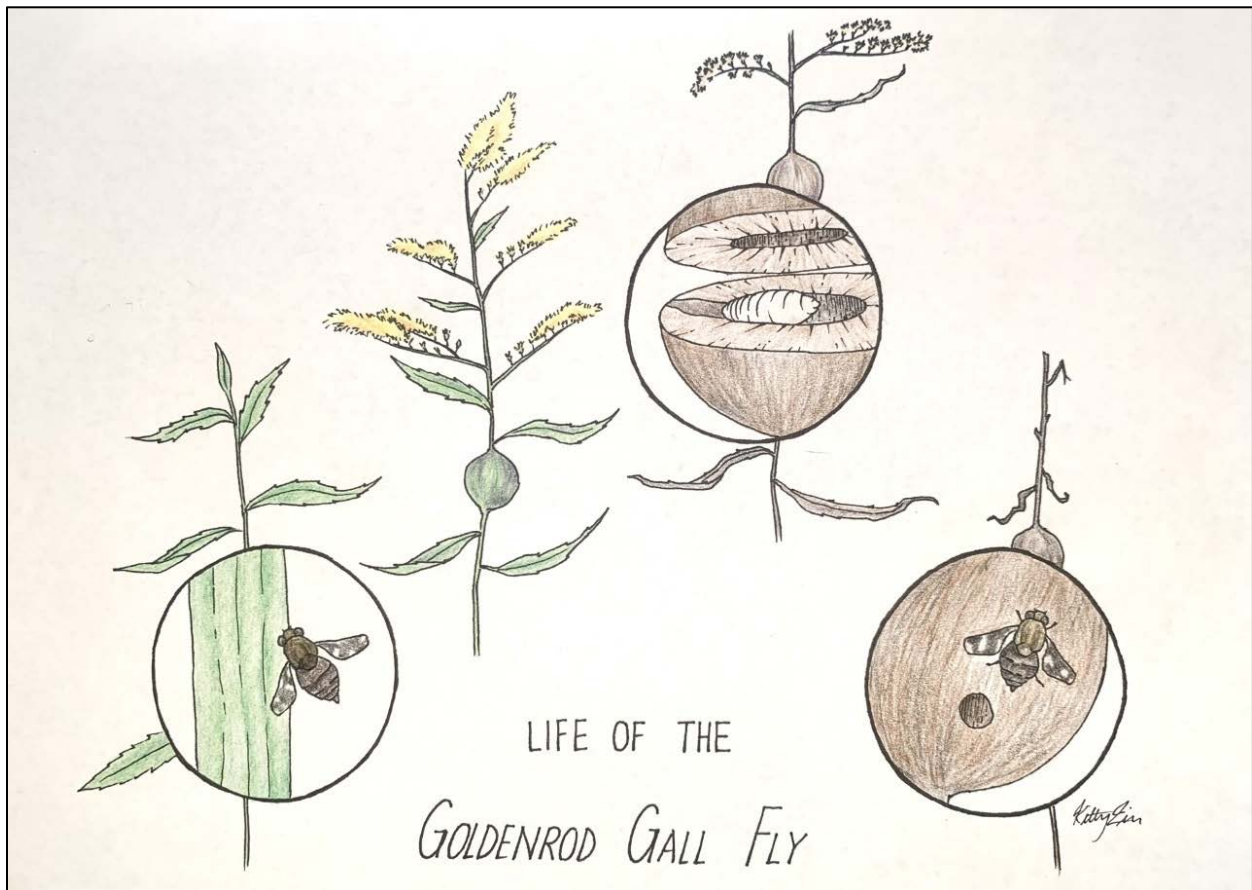
Goldenrod Gall Flies are small flies that leave goldenrod ball galls in the late spring. These flies then mate and the females lay their eggs in the stem of a goldenrod plant.

The eggs hatch into larvae that start to burrow and eat through the goldenrod stem as they grow through the summer. The chewing and the saliva of the larva signals to the plant to make this gall- a big lump of plant tissue- around the larva as the plant tries to block off this weird thing inside of it. This is great news for the larva! It chews a little room for itself in the middle of the gall, which is now going to act as both food and protection for the larva.

By late summer and fall, the larva starts to sense that winter is coming so it starts to prepare itself. First, it starts to chew a tunnel from its room inside the gall to almost the outside- but not all the way! The larva leaves just a small wall of plant tissue at the end of its tunnel (it does not want predators getting in!) before going back to its room. Then, it starts to make a bunch of glycerol (a type of sugar) inside of its body.

Then, winter comes, and the temperatures outside start to drop. In fact, it gets so cold that the Goldenrod Gall Fly larvae freeze solid! Thankfully, all that glycerol it made in the fall starts to come in handy...This glycerol acts a bit like antifreeze inside of the cells that make up its body. This means that, even though most of its body tissue freezes solid, the water inside its cells stays liquid. The water crystals that form from water freezing do not break all those cells, which is normally what would kill most other animals that freeze!

Then as spring comes and the days get warmer, the larva thaws back out and is good to keep going and growing! It transforms into a pupa and metamorphosizes into an adult fly, kind of like how a caterpillar will change into a butterfly. This adult fly is now ready to leave its gall. It leaves its room in the middle of the gall and follows the tunnel it made earlier to the outer wall of the gall. But this adult fly does not have chewing mouthparts like the larva, so it cannot chew through this wall to get out! Instead, this fly pushes its head against the wall and pumps a bunch of body fluids into a special part of its face, causing it to swell up like a balloon. This swelling pops open this last wall and lets the fly leave the gall! The cycle then starts all over again.



# Through the Seasons Worksheet

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

My Animal/ Plant: \_\_\_\_\_

Draw the stages of the animal/plant that you chose in the different seasons!

