

SPOTTED KNAPWEED. SEED DISPERSAL INVESTIGATION LESSON DETAILS

Seed Dispersal Investigation
(50 minutes)

Seed Discussion: Begin the activity by discussing plants and seeds.

What is a seed?

Why do plants have seeds?

A seed contains an embryo that will develop into leaves, stem and roots. Surrounding the embryo is a layer of tissue that stores enough food to nourish the tiny plant from the time it sprouts until its roots can take nutrients from the soil and its leaves can produce the plant's food. Outside this food-storage layer is an exterior coating that shelters the vulnerable embryo. The outer seed coat protects the embryo from desiccation, freezing, and other dangers. A tomato seed is apt to be swallowed, but its seed coat is relatively smooth and hard, so the seed passes through an animal's digestive system intact. Each kind of seed, no matter how tiny, has its own distinctive seed coat. A hand lens will reveal the ridges, indentations, and sometimes tiny hairs that give a seeds its characteristic markings.

STEP ONE. Seed Dispersal: Begin by asking the students--*Do all seeds look the same?* (no, every plant's seeds look different.) *What is the purpose of seeds?* (The formation of viable seeds is a plant's primary goal, spreading its seeds to a favorable location is it's next goal so the seeds can then germinate and create more plants.) *Why do plants have different types of seeds?* Each plant exists in a different habitat and employs different strategies to get a seed to spread and

germinate. *So, how can seeds travel?* Introduce the term "seed dispersal." Plants use a certain method to make their seeds "travel" and it is in seed dispersal that the seed container plays a vital role. Plants package their seeds in ways that best guarantee dispersal. *Looking at the three examples (Goat' Beard, Houndstongue and Pine cones), what is the method of seed dispersal or seed travel that these plants use?*

- Goat's Beard--seeds have light, fluffy umbrella design that carries them off in the wind.
- Houndstongue--seeds have little stickers all over the surface that causes them to stick to any passerby.
- Pine Trees--cones with seeds are sometimes collected and stored elsewhere by squirrels, or eaten and spread through animal scat.

STEP TWO. Seed Dispersal Investigation: Before investigation, have four different stations set up with four different types of seeds. Tell the students that you have different samples of seeds at different stations in the classroom. Students are to circulate with a partner to each station, fill in the name of the plant from which the seed originates, draw the seed and describe the seed's method of dispersal or traveling mechanism. Once the students have visited each of the stations, review the seed dispersal technique for each seed.

Seed Dispersal Methods Background:

Fruits: Many fruits are designed to appeal to animals that might act as dispersal agents for their seeds. Fruits may be colored, scented, or contain certain nutrients that appeal to a certain kind of animal: mammals, birds, fish, turtles, even worms or insects. In eating the fruit, an animal may swallow the seeds, discard the seeds, or store them for future use. Squirrels hide acorns and forget to retrieve them all. Cherry seeds pass unharmed through the birds that eat them and get deposited in the birds' droppings. In some dry areas of the world, ants gather seeds for the oils they contain but then discard the rest of the seed in "trash" chambers of their ant hill, where conditions are ideal for germination.

Wind: Other seed containers rely on ingenious design rather than sensory appeal in order to disperse the seeds they contain. Some have wings or blades to propel them through the air whichever way the wind takes them. Maple, ash, elm, pine and basswood have such seeds. Some seeds are borne along by the wind on parachutes or fluffy hairs. Airborne dandelion and milkweed seeds can travel long distances.

Hitchhikers: Other seeds have sharp hooks or barbs that attach to passerbys. Burdocks and beggar ticks are well-known hitchhikers. Many of us have learned through experience that the outer covering of the burdock seed head has hooks, and any attempt to remove it makes it fall apart, scattering the seeds.

Buoyancy: A few seed containers are buoyant and carry their seeds on the water to new destinations. Cranberries disperse their seeds in this way, as do other plants that grow in or near water.

Expulsion: There are even seed containers with seams that burst open with such force the seeds seem to explode from them. Jewelweed gets its other name, touch-me-not, from the sudden expulsion of seeds that follows touching a ripening pod.