SWAt activity kits and demonstration models are divided into three main categories:

- *Plant Growth and Development*
- *Ecology and Environmental Science*
- *Discovering Wildlife*

While a target grade range is suggested, many of these activities and demonstrations can be geared up or down to accommodate your individual needs.

Special Note

TEKS FOR EACH ACTIVITY NOW INCLUDED.

PLANT GROWTH AND DEVELOPMENT

PLANT PEOPLE

Objective: To learn what plants need to survive and thrive pointing out that plants can grow in many places—in the ground, in pots, and even in cracks in the sidewalk.

Students will use grass seed and soil to create their own *"Chia-like"* plant person to take home. Since Plant People are growing, living things, they will have an instruction booklet on how to care for them.

TEKS: K.7, K.9, 1.10, 2.9, 2.10, 3.9, 3.10

Time: 30 –45 minutes
Target Grade: K-3

PAPER POTS

Objective: To create recyclable pots and to propagate plants by seed. These pots can be made of newspaper or toilet paper/paper towel rolls and can be transplanted directly into the garden since the materials are biodegradable.

TEKS: K.9, K.8, K.10, 1.10, 2.9, 2.10, 2.11, 3.9, 3.10, 3.11, 4.7, 4.10, 5.9, 5.10

Time: 30-45 minutes
Target Grade: K-5

SEED BOMBS

Objective: To create *"seed bombs",* usually consisting of clay, compost and seed from native plants. Seed bombs are an easy way to scatter seeds. Unlike scattering seeds that are often eaten up by insects, birds or rodents, or washed away by rain, the seeds are protected inside a ball. Simply toss them in a sunny field or garden area. Nature takes care of the rest! These can also be made up in advance for a "grab-and-go" giveaway at larger events.

TEKS: K.7, K.9, K.10, 1.10, 2.9, 2.10, 2.11, 3.9, 3.10, 3.11, 4.7, 4.10, 5.9, 5.10
Time: 30- minutes
Target Grade: Any

GROW CARDS

Objective: To recycle newspaper and add seeds to create *"plantable"* greeting cards .

TEKS: 3.9, 3.10, 3.11, 4.7, 4.10, 5.9, 5.10, 6.10, 6.12

Time: 45 minutes
Target Grade: 3-6

VEGETABLE GARDENING

Objective: To introduce vegetable gardening, *with specific emphasis on fall vegetable gardens*, which can be the perfect fit for school gardens and outdoor learning centers. Learn about the various crops like potatoes, carrots, cabbage, lettuce and beans that can easily be incorporated into your fall garden and will be sure to impress young gardeners.

TEKS: 3,9, 3.10, 3.11, 4.7, 4.10, 5.9, 5.10, 6.10, 6.12, 7.10, 7.11, 7.14

Time: 60 minutes
Target Grade: 3-7

PAPER TOWEL GARDENING

Objective: To create seed mats and transplant templates to help organize and lay out the garden. This activity helps children learn about space requirements when planting a garden. It is also a great way to introduce or reinforce the math concept of fractions.

TEKS: K.1, K.9, 1.6, 1.10, 2.3, 2.9, 3.6, 3.9, 4.3, 4.7, 5.3, 5.9
Time: 30 minutes
Target Grade: K-5

SQUARE FOOT GARDENING

Objective: To guide students in planning and constructing a raised garden bed for square-foot gardening. SFG encourages people to build a square garden bed and, using a grid, divide it into 1-foot squares that are each planted with a different type of vegetable.

TEKS: 3.6, 3.9, 3.11, 4.3, 4.7, 4.8, 5.3, 5.8, 5.9, 6.8, 6.10, 6.12, 7.8, 7.10, 7.11, 8.7, 8.11

Time: 60 minutes

Target Grade: 3-12

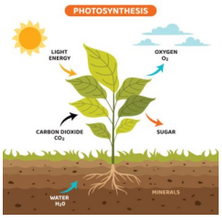
THE AIR WE SHARE

Objective: To demonstrate the interdependence people and other animals share with plants through the exchange of oxygen and carbon dioxide, explaining that plants breathe the carbon dioxide we exhale and breathe out the oxygen for us to use.

Time: 20-30 minutes

Target Grade: 3-5

LEAF FACTORIES *TURNING LIGHT INTO LUNCH*



Objective: To illustrate the process of photosynthesis by which plants make their own food within their leaves.

TEKS: 3.9, 4.1, 5.9

Time: 25 minutes

Target Grade: K– 5

SUPER SUCCULENTS

Objective: To demonstrate the unique adaptations of succulents that help them to survive in dry environments and to reinforce the importance of conserving water in our own lives.

TEKS: K.9, 1.1, 2.1, 3.9, 4.1, 5.9

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 3.11, 4.7, 4.10, 5.10

Time: 30-45 minutes

Target Grade: K-5

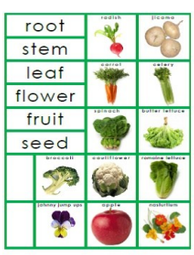
GALLON GREENHOUSE

Objective: To show an understanding of the environment needed to propagate plants. Students will create a mini greenhouse that will preserve moisture in the soil and air and help keep plants warm.

Time: 30 –45 minutes

Target Grade: 3-7

PLANT PARTS WE EAT



Objective: To identify all of the edible plant parts from a variety of crops. Companion book: *Tops and Bottoms*

TEKS: 3.9, 3.10, 3.11, 4.7, 4.10, 5.9, 5.10, 6.10, 6.12, 7.10, 7.11

Time: 30 minutes

Target Grade: K-5

ECOLOGY AND ENVIRONMENTAL SCIENCE

COMPOST CONNECTION

Objective: To teach students about recycling kitchen and yard waste, which materials can be composted, and how to get started. *Composting can divert as much as 30% of household waste away from the garbage can and is the single most important supplement you can give your garden soil.*

TEKS: 3.1, 4.8, 5.9, 6.10, 6.12, 7.11, 7.14

Time: 60 minutes
Target Grade: 3-7

VERMICULTURE
WORM COMPOSTING

Objective: To teach students about vermiculture, or worm composting, the process of converting organic waste into nutrient-rich humus called vermicast or worm castings. This demonstration and hands-on workshop will show you how to get started with your own worm composting project. The presenter will discuss different types of worm bins, and walk participants through worm bin construction and creation of starter kits.

TEKS: 3.9, 3.11, 4.8, 5.9, 6.10, 6.12, 7.11, 7.14

Time: 60 minutes
Target Grade: 3-7

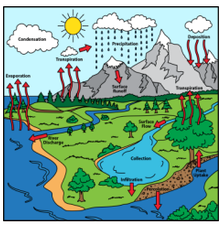
RECYCLE REVOLUTION

Objective: To help students understand the importance of recycling and how to implement a recycling program at home or at school. FYI: Did you know that in a lifetime the average American will throw away 600 times the amount of his or her adult weight in garbage? For example, a 150-pound adult will leave a trash legacy of 90,000 pounds. Unlike landfills (which simply stockpile trash) recycling removes waste completely, then turns it back to useful products.

TEKS: 3.11, 4.8, 5.9, 6.10, 6.12, 7.11, 7.14

Time: 30 minutes
Target Grade: 3-7

THE INCREDIBLE WATER CYCLE



Objective: This is a fun, interactive game that helps students better understand the movement of water through the water cycle. The game consists of 9 round spinners, each representing a location where water can be found (clouds, oceans, glaciers, etc.). As the students spin to see where the water molecule will go next, they collect a corresponding colored bead to place on a string to remind them of the "incredible water cycle."

TEKS: 2.8, 3.8, 4.8, 5.8, 6.10

Time: 30 minutes
Target Grade: 2- 6

RAINFALL SIMULATOR

Objective: To demonstrate water movement through various types of landscape soils and impervious surfaces. This demo consists of a frame that holds landscape trays, rain trays and collection trays. The demo contains four landscape trays representing impervious pavement, overgrazed rangeland with bare soil, well managed turf grass, and prairie grass; rain trays representing rainfall; and collection trays to collect surface runoff and groundwater. This demo requires a water source and enough room for a little splashing.

TEKS: 3.7, 3.8, 4.7, 4.8, 5.8, 6.10, 7.11, 8.9

Time: 15-30 minutes
Target Grade: 3-8

FREDDY THE FISH

Objective: To demonstrate to young students how different sources of pollution can affect clear streams and eventually make an unlivable habitat for wildlife. With this activity, each student will get a plastic fish (Freddy) and plastic container to use during the program. A small amount of water and a variety of "pollutants" will be added to Freddy's environment to show how pollution affects wildlife.

TEKS: PreK.8, PreK.9, K.9, K.10, 1.7, 1.10, 2.10, 2.11

Time: 15-30 minutes
Target Grade: PreK-2nd

ENVIROSCAPE

Objective: This interactive lesson makes use of a model town that shows students how our daily habits impact the environment and disturb the natural balance of the urban water cycle. Students will gain knowledge of the combined effects that pollution from many small sources can have on our watershed and our lives. This demo requires a water source.

TEKS: 1.7, 1.8, 2.10, 2.11, 3.7, 3.8, 4.7, 4.8, 5.8, 5.9, 6.10, 6.12

Time: 30 minutes
Target Grade: 3-6

STREAM TRAILER

Objective: To help youth understand how stream channels form, how vegetation contributes to stream-bank stability, and how proper stewardship can help prevent erosion. This model demonstrates stream processes and best management practices to protect and restore our streams and rivers. This is an out-door activity and requires a flat surface and access to water and electricity.

TEKS: 3.7, 3.8, 4.7, 4.8, 5.8, 6.10, 7.11

Time: 30-45 minutes
Target Grade: 3-7

HOW WATER WORKS

Objective: To demonstrate the properties of water, including surface tension, adhesion and cohe-sion. Using an eye dropper, the participants count how many drops of water they can get on the top of a penny. As the water mounds and actually hangs over the edge of the penny, these properties of water are at work. This is a great activity for fairs and other public events. It is also a great way to get attention for visitors to your exhibit booth. This is a simple activity that people of all ages can enjoy and the vocabulary can be adjusted for any age group.

TEKS: K.8, 1.8, 2.8, 3.8, 4.8, 5.5

Time: 15 minutes
Target Grade: Any

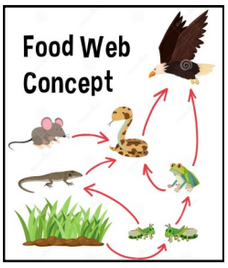
HABITATS AND BIOMES

Objective: To introduce students to a variety of natural environments in which plants and/or animals normally live and grow. Presentation can be tailored to environment-specific, i.e. desert, grassland, wet-lands, forest, polar regions, oceans and tundra.

TEKS: 3.9, 4.7, 4.10, 5.10, 6.10, 7.10, 7.14

Time: 60 minutes
Target Grade: 3-7

THE FOOD WEB



Objective: To use game play to teach students about the interrelatedness between animals and the environment and to emphasize the transfers of energy within the food web.

TEKS: K.9, 1.10, 2.10, 3.9, 4.10, 5.9

Time: 25 minutes
Target Grade: K-5

DISCOVERING WILDLIFE

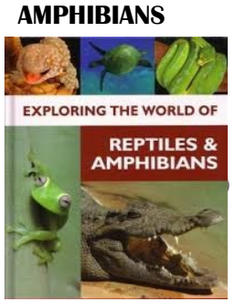
MAMMALS

Objective: To help students understand the role of wildlife in our communities, focusing on how mam-mals interact in the ecosystem. This kit is actually *composed* of four (4) related kits: tracks, pelts, skulls, and scat that include specimens of mammals such as opossum, coyotes, etc. These kits may be discussed separately or together for a given presentation. Either separately or together, these kits provide an overview of the anatomy and physiology of a given class of mammals and help participants better understand the behavior of a given animal as well as its typical habitat.

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 45-60 minutes
Target Grade: K-7

REPTILES & AMPHIBIANS



Objective: To encourage students to explore the outdoors by learning about wildlife, focusing on how reptiles and amphibians differ and interact in the ecosystem. Associated with this kit are a variety of preserved amphibians, turtles and snakes.

A live snake component focusing on snakes of Texas may also be requested if you wish to make that the lesson focus.

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 45-60 minutes
Target Grade: K-7

OWLS

Objective: To learn how owls see and hear and what their role is in the environment. As top predators, owls play a crucial role in maintaining ecosystem balance by controlling rodent and other small animal populations, which helps prevent overpopulation and potential damage to crops. In North Texas, you can find several owl species, including the Great Horned Owl, Barred Owl, Barn Owl, Eastern Screech Owl, Burrowing Owl, Long-eared Owl, and Short-eared Owl.

TEKS: 3.7, 3.8, 4.7, 4.8, 5.8, 6.10, 7.11

Time: 30 minutes
Target Grade: 3-7

BATS

Objective: To encourage students to learn about the vital role of bats in the ecosystem for pest control and pollination. The presenter will typically discuss the anatomy, physiology, behavior and habitat for bats. *Instructions for building a bat house can be included upon request.*

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 45-60 minutes
Target Grade: K-7

THE BUZZ ON BEES

Objective: To learn differences between honeybees and native bees and their importance in the environment. Discussion about plants and herbs you can plant to help create a bee-friendly yard. FYI did you know that bees pollinate one out of every three bites of American food and $15 billion worth of crops annually?

TEKS: 3.8, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 60 minutes
Target Grade: 3-7

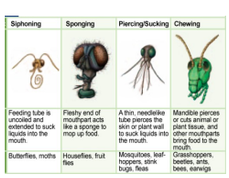
INSECT INVESTIGATIONS

Objective: To assist students in learning about insects (butterflies are insects), to provide information about insects that are considered beneficial to humans and others that are *considered pests*, and why all insects are important in an ecosystem. Preserved insect displays are provided for display only. *This lesson can be tailored to the specific* topic being taught. Available related lessons include "Garden Friend or Foe," "Don't Bug Me!", "Who Goes There?" "Insect Mouth Parts-Chew on This!"

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 45-60 minutes
Target Grade: K-7

INSECT MOUTH PARTS *Chew on This!*



Siphoning	Sponging	Piercing/Sucking	Chewing
Feeding tube is uncoiled and extended to suck liquids into the mouth.	Fleshy end of mouthpart acts like a sponge to mop up food.	A thin, needlelike tube pierces the skin or plant wall to suck liquids into the mouth.	Mandible pierces or cuts animal or plant tissue, and other mouthparts bring food to the mouth.
Butterflies, moths	Houseflies, fruit flies	Mosquitoes, leafhoppers, stink bugs, fleas	Grasshoppers, beetles, ants, bees, earwigs

Objective: To learn the four types of insect mouth parts: chewing, piercing/sucking; siphoning and sponging and how they are specialized. *This can be a companion kit to "Insect Investigations."*

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 30 minutes
Target: Grade: K-7

SUCK-A-BUG!

Objective: To make a simple aspirator and use it to collect and observe small insects.

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.10, 6.12, 7.10, 7.14

Time: 60 minutes
Target Grade: K-7

BIRDS

Objective: To educate students on the important role of birds in our environment. A presentation typically focuses on anatomy, physiology, behavior and habitat for given species. Included in the presentation are representative, preserved specimens for display only of owl, duck and hawk. *A* bird feeder activity can be included upon request. “Beak Tools” is a related kit.

TEKS: K.9, K.10, 1.10, 2.9, 2.10, 3.9, 4.7, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 45-60 minutes
Target Grade: K-7

BEAK TOOLS

Objective: To compare how different tools function similarly to different types of bird beaks and explain how each type of beak is adapted to feed on specific foods. *“Birds” is a related kit.*

TEKS: 3.9, 4.10, 5.10, 6.12, 7.10, 7.14

Time: 30 minutes
Target Grade: 3-7

KITS FOR EXTENDED CHECKOUT & USE IN THE CLASSROOM

HYDROPONICS MINI KIT

Plant Growth and Development

Objective: To teach students and have them observe the complete lifecycle of the plant from your classroom. Explore STEM concepts with how to grow plants without soil, using grow lights, timers, water and nutrients. Theoretically, anything that can be grown in soil can be grown in a hydroponic environment. Plants like lettuce, herbs, strawberries, spinach, bell peppers, and cherry tomatoes do particularly well in even the most basic of hydroponic setups. Our kit includes grow lights, nutrients and seeds.

Target Grade: 3-12

WORM FACTORY

Ecology and Environmental Science

Objective: To help students understand the importance of reducing landfill waste through vermiculture (worm composting). Vermicomposting recycles trash in an efficient and environmentally friendly manner by using worms to recycle garbage. Worms eat and metabolize organic matter. Their digested excrement—castings—is full of nutrients that can be incorporated into the soil to help with plant fertilization, soil enhancement , and soil stability.

Target Grade: 3-12

HATCHING EGGS IN THE CLASSROOM

An Egg-to-Chick Life Cycle Study

Discovering Wildlife

Objective: To help students learn biological concepts and develop a deeper understanding of the life sciences. Incubating and hatching chicken eggs in the classroom is a hands-on learning experience. Classroom experiments with chicken embryos can help you teach complex systems such as nutrition and the circulatory system, or more basic skills such as data measurement, collection, and analysis. Examining embryos at different stages of growth, and observing a beating heart are just two of the projects you can use.

Target Grade: K-12

RESOURCES FOR EDUCATORS

Ideas and Planning for School Gardens and Outdoor Learning Centers

Things to consider if you are contemplating a school garden or outdoor learning center:

- Have you secured administration support and approval?
- Do you have teacher buy-in?
- Are the students involved?
- Do you have a development team committed to the project?
- Have you selected the site?
- What is your funding source?
- What is your maintenance and long-range plan for sustainability?

Get a full copy of SWAT's manual "Ideas and Planning for School Gardens and Outdoor Learning Centers" on SWAT's Main Webpage

JUNIOR MASTER GARDENER (JMG) PROGRAM/CLUB

The Junior Master Gardener curriculum engages children in novel, "hands-on" group and individual learning experiences that promote a love of gardening, develop an appreciation for the environment, and cultivate the mind. The success of the program relies upon the JMG Teachers/Leaders. A full library of resources is available to prepare teachers & leaders to successfully engage students in this novel program. For additional information go to: https://jmgkids.us/what-is-jmg/get-started.

JUNIOR MASTER NATURALIST (JMN) PROGRAM/CLUB

The Texas Junior Master Naturalist Program will provide youth ages 9-13 with an understanding of Texas' plants, water, soils and wildlife while volunteering in local communities and developing a sense of stewardship in our environment. The JMN program uses many resources but one of the most important is the ***Growing Up Wild project*** initiated by the Council for Environmental Education. For more information go to: https://txmn.org/resources/jrmastnat/

DENTON COUNTY 4-H PROGRAM/CLUB

4-H is a community of young people across America who are learning leadership, citizenship and life skills. 4-H is about having fun, learning, exploring and discovering. In 4-H, young people make new friends, develop new skills, become leaders and help shape their communities. More than 65,000 Texas youth are enrolled members of 4-H community clubs in Texas. Another 850,000 Texas youth get involved in 4-H through special educational opportunities at school, in after school programs, or at neighborhood or youth centers. 4-H gives them a chance to pursue their own interests – from photography to computers, from building rockets to raising sheep. A list of 4-H projects is available here. They go places – to camp, to state and national conferences. They learn to be leaders and active citizens. For more information go to: https://denton.agrilife.org/4h/