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| **Grade 3rd** | **Lesson:** **Habitat: Small Environment-3** | Reference to English Interconnections LessonHabitat: Small Environments pg. 50 |
| **Science Standard(s): Standard 2.2** Interrelationships: Communities and their Environments |
| **Content Objective(s):**  | **Language Objective(s):** |
| Students will observe and record the effect of changes upon the living organisms and nonliving things in a small-scale environment. ***Je peux observer un terrarium et notez les changements sur les choses vivantes et non-vivantes.*** | Students will follow multi-step oral and written directions to make and observe a terrarium or aquarium as a class. ***En tant que classe, je peux suivre des instructions écrites et dites en plusieurs étapes pour faire un terrarium.*** |
| **Essential Questions:** How do living and non-living things adapt as the size of their environment grows? | **Academic Vocabulary:** **Listen:** un environnement, vivant, non-vivant, un organisme, vivre, observer, un terrarium, un aquarium, la température, l’humidité, un habitat**Speak:** un environnement, chose vivante, chose non-vivante, survivre**Read:** choses vivantes, choses non-vivantes**Write:**  |
| **Materials:*** Note to go home 1 month before lesson to collect materials for terrariums from home
* Text to be displayed along with appropriate pictures to support comprehension of the text
* Materials for a terrarium or aquarium. See information sheet for possibilities. You can make 1 for all of the class to observe or have groups of 3-5 students each make one.
* Plants or seeds
* Animal such as earthworms, mealworms, crickets, pill bugs, etc. These will be added to the terrariums a few days after building the terrariums so they are stabilized.
* Nonliving things such as rocks, soil, and sticks
* Set of written instructions with picture clues for how to make a terrarium. Can be on a poster, projected on a screen, etc.
* Terrarium or Aquarium Observations Sheet
 | **Additional Lesson Vocabulary:** un environnement, vivant, non-vivant, un organisme, survivre, observer, la température, l’humidité, affecter, les effets**Sentence Frames:** |
| **Lesson:**  | **Instructional Time:**  |
| **Note: 1 month before beginning this lesson, send home the note requesting donations from parents of objects to make the terrarium. Gather the materials and decide if you will make just one terrarium or aquarium for the entire class to observe, or if you will divide the students into groups of 3-5 to each make one. This lesson will assume you will have each small group of students make a terrarium, but you can adapt for your decision. Remember the Utah Core Curriculum states students must “Observe and record the effect of changes (e.g., temperature, amount of water, light) upon the living organisms and nonliving things in a small–scale environment. “****Opening:** **(5 minutes)*** Show the students the creatures you are going to place in the terrariums.

**T: “Nous avons appris des choses sur les environnements et comment les choses vivantes et non-vivantes survivent dans un habitat. Aujourd’hui, nous allons faire des petits environnement pour cet organisme vivant…un ver.”** (or whatever creature you are going to use)**T: “Revoyons ce dont un ver a besoin pour vivre. Voici un paragraphe que nous allons lire et où nous apprendrons des choses sur ce dont ce ver a besoin. Lisez-le puis tournez-vous vers un voisin et dites-lui ce dont un vers a besoin.”*** Display the following text on a screen or poster with pictures of worms and the items in the paragraph.

Earthworms like cool temperatures. Soil mixed with leaves makes a good environment for worms. Water the soil to keep it moist, but do not over water. Place two or three earthworms on the surface and they will burrow or dig into the soil. Add a thin layer of leaves or shredded newspaper to help reduce moisture loss. Small amounts of food should be added. Earthworms will eat almost any kind of organic debris such as shredded bits of grass, dried leaves, lettuce, and apple or potato peels. Keep the earthworms in the coolest place in the room.*S: Students read the text and tell each other what is needed for the worms to survive like soil, water, leaves, newspaper, etc.***T: “Bien. Soulignons ce dont les vers ont besoin pour vivre. Qui peut venir souligner une chose dont les vers ont besoin ?”*** Call on students to come up and underline the things needed for worms: soil, water, newspaper, and leaves.

**T: “Bon travail. Maintenant, nous avons une liste de choses dont nos vers ont besoin pour survivre. Nous pouvons utiliser cette liste pour faire un terrarium. “*** **Introduction to New Material (Direct Instruction): ( 5 minutes)**

**T: “Levez votre main si vous pouvez me dire ce qu’est un terrarium.”***S: “Un terrarium a des plantes et des animaux.” “C’est une boîte avec de la terre et des plantes.” Etc.***T: “Un terrarium contient un petit environnement. Il y a des organismes vivants et des choses non-vivantes dedans. Un terrarium est une petite version d’un habitat comme une forêt ou un désert.”*** Show an example of a terrarium already completed or a picture of a terrarium.

**T: “Dans un terrarium, vous trouverez tout ce dont l’organisme a besoin pour vivre. Nous allons faire un terrarium qui aura un environnement dans lequel nos vers peuvent survivre.”****Guided Practice (30)*** You may want to make the terrariums outside if the weather is nice to help with cleanup. If not, place newspapers on the desks. Assign the students to groups of 3-5 students. Choose one student from each group to be a “coureur” to pick up materials from the teacher for the group.

*Use the modeling cycle: (In each case the teacher will demonstrate and then the students will do. Watch students as they complete each step to assure they are doing the step correctly. )***T: “Commençons. La première chose dont nous avons besoin est un conteneur et des petits sacs en plastique (ziplock bags) de terre. Je voudrais que le coureur vienne prendre un conteneur et un sac de terre.”***S: One student gets the container and soil.***T: “Premièrement, regardez-moi puis attendez le signal pour faire cette étape. Je vais prendre la terre du sac et la mettre dans le conteneur. Maintenant, faites-le.”** (Demonstrate the step and show the written instructions for the step with picture clues.)*S: Student place soil in the container.***T: “Deuxièmement, nous allons mettre des feuilles et du papier journal déchiré avec la terre et nous allons mélanger.”** (Demonstrate the step and show the written instructions for the step.)*S: Students place leaves and shredded newspaper in the soil and mix it around.***T: “Troisièmement, nous allons mettre des pierres, des bouts de bois et des plantes dans le terrarium. Faites attention aux racines des plantes et placez-les bien dans la terre. S’il vous plaît, envoyez un coureur pour prendre les pierres, les bouts de bois et les plantes..”***S: Students place rocks and plant small plants in the terrarium.* **T: “La quatrième étape est de vaporiser de l’eau dans le terrarium pour avoir de l’humidité dans l’environnement. Chaque équipe aura besoin d’un vaporisateur. Vaporisez environ 5-6 jets d’eau dans le terrarium. Il faut que cela soit humide, mais pas détrempé (plein d’eau). Regardez comment faire.“** (Demonstrate spraying water in the terrarium. )**T: “Maintenant, envoyez votre coureur pour prendre le vaporisateur.”***S: Runner gets the spray bottle and the group sprays some water in the terrarium.** Make sure the soil is damp, but not soggy or muddy. If the soil is too wet, leave the lid open for a day or two to let it dry out.

**T: “N’oubliez pas de mettre le couvercle sur le terrarium.”***S: Students put the lids on the terrariums.***T: “Maintenant, nous allons mettre les terrariums dans la pièce, comme cela ils peuvent commencer à se stabiliser ( ??? to stabilize). Dans quelques jours, nous pourrons mettre les vers dans les terrariums. Puis nous pourrons les observer pendant les semaines suivantes.*** Place the completed terrariums under grow lights or in a bright place in the room. Do not place the terrariums in direct sunlight as they may overheat and harm the plants.
* Clean up extra materials and work area.
* Hand out Terrarium Observation Sheets

**T: “Rappelez-vous que les bons scientifiques notent leurs observations. Nous allons noter ce que nous observons dans les environnements de nos terrariums. Laissez-moi vous montrer ce que nous ferons..*** Show the Terrarium Observation Sheet on a document camera or projected on the white board.

**T: “D’abord, nous mettons la date d’aujourd’hui dans la première case.** * Teacher puts the date in the box.

**T: Dans la case suivante nous devons écrire combien de plantes il y a et décrire à quoi elles ressemblent. Dans mon terrarium, j’ai 3 plantes et elles mesurent environ 2 inches. Je vais les mesurer avec une règle pour être sûre. ”*** Teacher measures the plants with a ruler
* Write 3 plants, 2 inches tall

**T: “Elles sont aussi vertes, donc je vais l’écrire.”*** Writes “Plants are green.”

**T: “Dans la case suivante, nous devons écrire combien il y a d’animaux ou d’insectes et s’il y a des bébés. Pour le moment, nous n’avons pas d’animaux parce que nous ne les avons pas encore mis, donc je vais écrire zéro. Mais la prochaine fois que nous observerons, j’écrirai le nombre de vers ou autres insectes que je verrai dans le terrarium.”*** Writes zero in the box.

**T: “La troisième case demande les changements. Nous allons laisser cette case vide aujourd’hui parce que c’est le premier jour de notre terrarium. La prochaine fois, nous observerons les changements de notre terrarium.”****T: “Dans la dernière case, nous devons faire un dessin. Nous pouvons faire notre dessin dans la petite case ou faire un dessin sur une autre feuille en écrivant la date sur la feuille. Puis on agrafera les deux feuilles. Voici le dessin de mon terrarium.”*** Teacher draws a simple drawing of the terrarium pointing out the living and non-living things in the terrarium.

**T: “Maintenant, vous êtes prêts à noter vos observations. Aujourd’hui, vous avez 5 minutes pour écrire vos observations. Quand vous avez fini, s’il vous plaît, mettez vos observations dans ce panier et lisez un livre jusqu’à ce que le temps soit fini.*** If you have not introduced a Science notebook yet, this would be an appropriate time to do so. A Science notebook can be any kind of notebook in which the students record their observations, notes, drawings, etc. for Science. In this lesson, students can record their observations on the observation sheet and place it in the notebook or students can record their observations directly in the notebook using a format similar to the observation sheet provided.

**Independent Practice: ( 5 minutes)***S: Students fill out their Terrarium Observation sheets and turn them in to the basket.** Teacher circulates around the room helping students with recording observations in the boxes.

**Closing: ( 2 minutes)****T: “Durant les prochaines semaines, nous noterons nos observations des changements de notre terrarium.**A few days later:**T: “Maintenant, il est temps d’ajouter 2 vers dans chaque terrarium. Souvenez-vous d’être gentil et respectueux avec ces organismes vivants. Il faut les prendre doucement et les mettre dans la terre comme cela..”** (Demonstrate how to handle the worms and place them on the soil.)*S: Student runner gets 2 worms for each group and places them in the terrarium.* **T: “Faisons maintenant une autre observation. Cette fois, nous pouvons écrire le nombre d’animaux ou d’insectes dans notre terrarium.”*** Teacher models how to fill out the observation sheet

*S: Students fill out observation sheet and turn them in to the basket to keep for the next observation.* |
| **Assessment:** |
| Note which students were able to follow the multi-step instructions.Use the Terrarium Observation Sheets to assess student’s understanding of observing changes in the terrarium environment. |
| **Extra Ideas:** |
|  |

Dear Parents,

Next month we will be building terrariums in class for the students to observe as part of our Science class. We would like to have enough materials for each small group of students to make one. If you have any of the following items and would like to donate them to our class, please send them in by \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Thank you very much.

Sincerely,

Mrs/Mr. Science Teacher

 Plastic empty 2 liter bottle

Soil

Gravel

Small plants

Seeds for small plants

Rocks

Crickets

Pill bugs

Snails

Earthworms

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**Observations du terrarium**

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| --- | --- | --- | --- | --- |
|  **Date** |  **Les plantes**-Combien?-À quoi  ressemblent-t-  elles? | **Les animaux les insectes**-Combien?-Y a-t-il des  bébés? | **Les changements**-As-tu ajouté de la  nourriture?-As-tu ajouté plus  de plantes ou  d’animaux? |  **Les dessins** |
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**Creature Information (Teacher page)**

**EARTHWORMS:** To house a dozen or so earthworms for a few days, place them in a cottage cheese carton or similar container half filled with moist soil. A lid with small holes punched in it will keep the worms from escaping. Earthworms like cool temperatures. If kept in the refrigerator, they will live for several weeks. (Just be sure to label the container.) A breeding colony can be maintained in a larger container, such as a plastic tub, an aquarium, or even a large bucket. Soil mixed with leaf litter, compost, peat, sawdust, or cow manure makes a good medium for worms. Water the soil to keep it moist, but do not over water. Place two or three dozen earthworms on the surface and they will burrow into the soil. Add a thin layer of leaf litter or shredded newspaper to help reduce moisture loss. Small amounts of food should be added to the surface. Earthworms will consume almost any kind of organic debris. They can be fed shredded bits of grass, dried leaves, lettuce, and apple or potato peals. Keep the earthworms in the coolest place in the room.

**LAND SNAILS:** Snails can be found in leaf litter, under rocks or logs, and in other damp locations. They can be kept in transparent plastic shoeboxes or aquariums arranged to simulate the natural environment. Containers will need to be covered to maintain the necessary humidity and to keep snails from escaping, but will also need some ventilation. Soil on the bottom of the container will help to maintain the humidity.

Captive snails will consume a variety of foods: lettuce, carrots, apples, or celery will meet their needs.

**TERESTRIAL ISOPODS (pill bugs, potato bugs):** Land isopods live in dark moist places. They are easily collected by turning over rotting logs, boards, bricks, or rocks. To keep classroom isopods, put 3 cm of potting soil in a plastic sweater box, or terrarium. Provide a dark place by setting a piece of corrugated cardboard on a few pebbles. Add a few pieces of decaying bark or wood. Sprinkle the container with water, making sure the habitat is damp but not saturated. Feed the isopods a slice of potato, carrot, lettuce, or ripe fruit. Remove food that begins to mold. Cover the habitat with a lid that allows ventilation. You should see young in three to four weeks.

**MEALWORMS:** Mealworms can be purchased at pet stores and bait shops. They can be kept in a ventilated, non-cardboard container. Mealworms come with a supply of food but will need to be given additional food if they are going to be kept for a long time. Any dry cereal will work as food, either flakes, oatmeal, or bran. Your mealworms will also need a source of water. Water can be provided by placing a slice of apple, carrot, or potato in with the mealworms. Mealworms spend most of their lives in the larval stage, typically six to eight months.

**CRICKETS:** Crickets can be purchased from most pet stores. To keep crickets for a short time in the classroom, place 2 - 4 cm of soil or sand in a jar or other container with a ventilated lid. Add a crumpled paper towel for the crickets to climb on and to provide hiding places. Crickets will eat a variety of foods; a slice of apple, carrot, or potato are good short-term foods and will provide the crickets with the moisture they need. Food should be replaced every day or two so it will not decay or mold.

**Terrariums and Aquariums (Teacher page)**

**Terrariums**

**Containers**

Terrariums can be made in many types of containers. Plastic peanut butter jars or similar clear plastic storage jars, clear plastic deli containers, or clear 2-3 liter pop bottles can all be used for small terrariums. Larger terrariums can be constructed in glass aquariums or plastic animal cages. To make it easy to set-up and maintain, containers should have a large removable lid. A screen or glass lid for a glass aquarium works well.

**Soil**

Any good potting soil can be used. Local soils may also be used. Collecting local soil for the terrarium can add a little extra in the form of seeds and creatures collected with the soil. A mixture of 1/2 potting soil and 1/2 local soil usually works well. In larger terrariums, it is helpful to add a layer of small gravel, such as aquarium gravel, to the bottom of the terrarium before adding the soil. The gravel will allow extra water to drain from the soil. The size of the container will determine the amount of soil. Smaller containers should be filled with about 1/3 with soil. Larger containers should have 4-6 inches of soil added. Soil should be damp but not wet before adding it to the terrariums.

**Plants**

Many types of plants can be used in terrariums. The type of plants you choose will depend on what kind of light is available. If grow-lights are used, sun-loving plants such as grasses and alfalfa can be grown. If only ambient room light is available, shade loving plants will do better. Violets, strawberries and many kinds of houseplants will grow well in most room light. Plants may either be started by planting seeds or transplanting already established plants. A good method is to collect some local plants, such as violets or strawberries, and transplanting them. This will give a quick start to the terrarium. Then plant some seeds that will begin to grow and may be used as a food source by creatures that are added. Students may want to collect some seeds from local weeds and other plants to sow in their terrariums. To plant seeds, scatter them on the surface of the soil and then cover the seeds with a thin layer of soil.

**Water**

The soil in the terrarium should be kept moist but not muddy. If the terrarium is not vented, very little water should need to be added. If a screen lid is used, regular watering will need to be done. Watering the terrarium with a spray bottle is easy and will leave water drops on the leaves of plants that can be used by any creatures that call the terrarium home.

**Other**

Adding small stones and sticks can add interest to terrariums and will give creatures a place to hide and climb. Allow students to collect items to place in their terrariums. Leaf litter is also good to have in the terrarium. Many creatures, such as pill bugs, worms, and snails, will hide in the litter. Students will be able to observe the litter decompose as it is eaten by these small creatures.

**Aquariums**

Aquariums can also be large or small and can be used to provide a home for many interesting creatures.

**Pond**

If you are close to a pond, or other natural, wet environment, it is simple to collect enough water and organisms to set up a pond aquarium in the classroom. About a gallon of water is sufficient. Be sure to get some of the mud off the bottom and some of the local aquatic plants and algae. If possible, collect water snails, minnows or other creatures for your aquarium. Additional water may be needed as water in the aquarium evaporates. Untreated well or spring water can be added directly to the aquarium. If tap water is being used, let it sit for 24 hours to allow the chlorine to dissipate before adding it to the aquarium.