End of the Year

STEM

waterproof critter House

CREATED BY BROOKE BROWN

contents

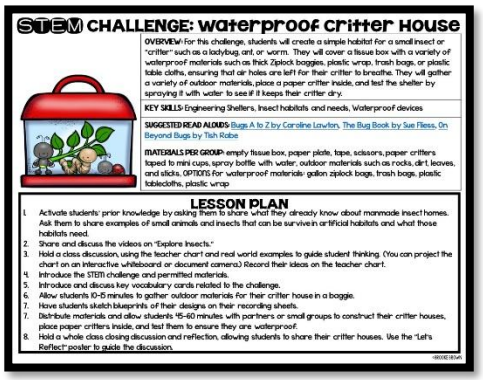
How to use

The following STEM/STEAM challenge is designed to be completed with partners or in small groups. You will need to allow 45-60 minutes for the full activity to be completed. Needed supplies can be found in your classroom or at most craft stores.

components

LESSON PLAN

- Overview
- Skills
- Read Aloud Ideas
- Supplies


STEM CHALLENGE: Waterproof Critter House

OVERVIEW: For this challenge, students will create a simple habitat for a small insect or "critter" such as a ladybug, ant, or worm. They will cover a tissue box with a variety of waterproof materials such as thick Ziplock baggies, plastic wrap, trash bags, or plastic table cloths, ensuring that air holes are left for their critter to breathe. They will gather a variety of outdoor materials, place a paper critter inside, and test the shelter by spraying it with water to see if it keeps their critter dry.

KEY SKILLS: Engineering Shelters, Insect habitats and needs, Waterproof devices

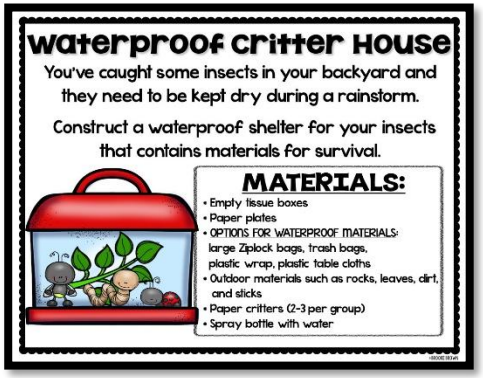
SUGGESTED READ ALOUDS: Bugs A to Z by Caroline Lawton, The Bug Book by Sue Fliess, On Beyond Bugs by Tish Rabe

MATERIALS PER GROUP: empty tissue box, paper plate, tape, scissors, paper critters taped to mini cups, spray bottle with water, outdoor materials such as rocks, dirt, leaves, and sticks, OPTIONS for waterproof materials: gallon ziplock bags, trash bags, plastic tablecloths, plastic wrap

LESSON PLAN

1. Activate students' prior knowledge by asking them to share what they already know about manmade insect homes. Ask them to share examples of small animals and insects that can be survive in artificial habitats and what those habitats need.
2. Share and discuss the videos on "Explore Insects."
3. Hold a class discussion, using the teacher chart and real world examples to guide student thinking. (You can project the chart on an interactive whiteboard or document camera.) Record their ideas on the teacher chart.
4. Introduce the STEM challenge and permitted materials.
5. Introduce and discuss key vocabulary cards related to the challenge.
6. Allow students 10-15 minutes to gather outdoor materials for their critter house in a baggie.
7. Have students sketch blueprints of their designs on their recording sheets.
8. Distribute materials and allow students 15-60 minutes with partners or small groups to construct their critter houses, place paper critters inside, and test them to ensure they are waterproof.
9. Hold a whole class closing discussion and reflection, allowing students to share their critter houses. Use the "Let's Reflect" poster to guide the discussion.

STUDENT INSTRUCTIONS


Waterproof Critter House

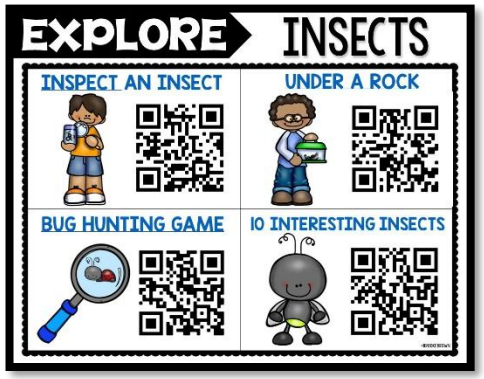
You've caught some insects in your backyard and they need to be kept dry during a rainstorm.

Construct a waterproof shelter for your insects that contains materials for survival.

MATERIALS:

- Empty tissue boxes
- Paper plates
- OPTIONS FOR WATERPROOF MATERIALS: large Ziplock bags, trash bags, plastic wrap, plastic table cloths
- Outdoor materials such as rocks, leaves, dirt, and sticks
- Paper critters (2-3 per group)
- Spray bottle with water

QR CODE WEBSITES & VIDEOS


EXPLORE INSECTS

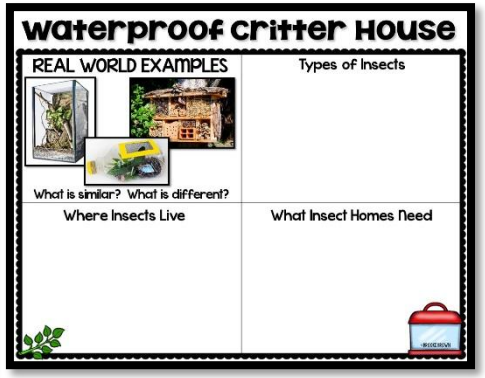
INSPECT AN INSECT

UNDER A ROCK

BUG HUNTING GAME

10 INTERESTING INSECTS

TEACHER ANCHOR CHART


Waterproof Critter House

REAL WORLD EXAMPLES

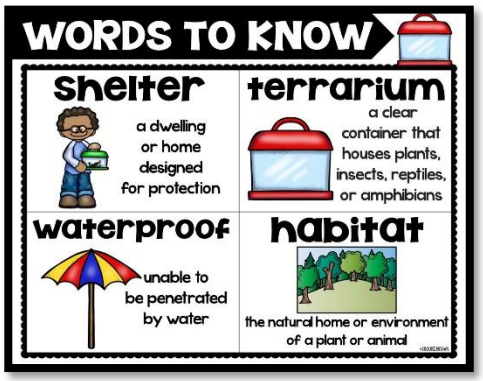
What is similar? What is different?

Types of Insects

Where Insects Live

What Insect Homes Need

KEY VOCABULARY


WORDS TO KNOW

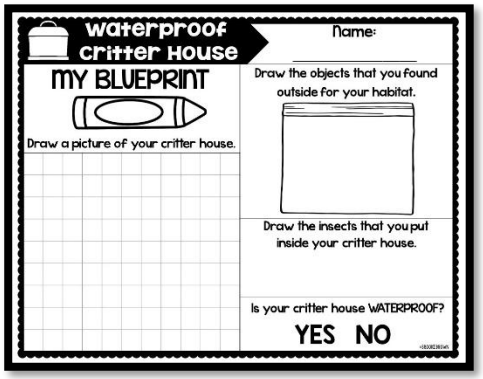
shelter — a dwelling or home designed for protection

terrarium — a clear container that houses plants, insects, reptiles, or amphibians

waterproof — unable to be penetrated by water

habitat — the natural home or environment of a plant or animal

K-2nd RECORDING SHEET


Waterproof Critter House

Name: _____

MY BLUEPRINT

Draw a picture of your critter house.

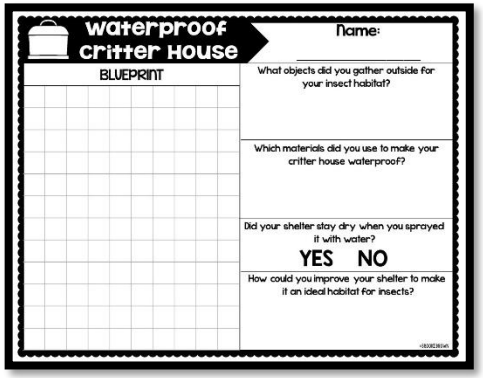
Draw the objects that you found outside for your habitat.

Draw the insects that you put inside your critter house.

Is your critter house WATERPROOF?

YES NO

3rd-5th RECORDING SHEET


Waterproof Critter House

Name: _____

BLUEPRINT

What objects did you gather outside for your insect habitat?

Which materials did you use to make your critter house waterproof?

Did your shelter stay dry when you sprayed it with water?

YES NO

How could you improve your shelter to make it an ideal habitat for insects?

REFLECTION DISCUSSION QUESTIONS

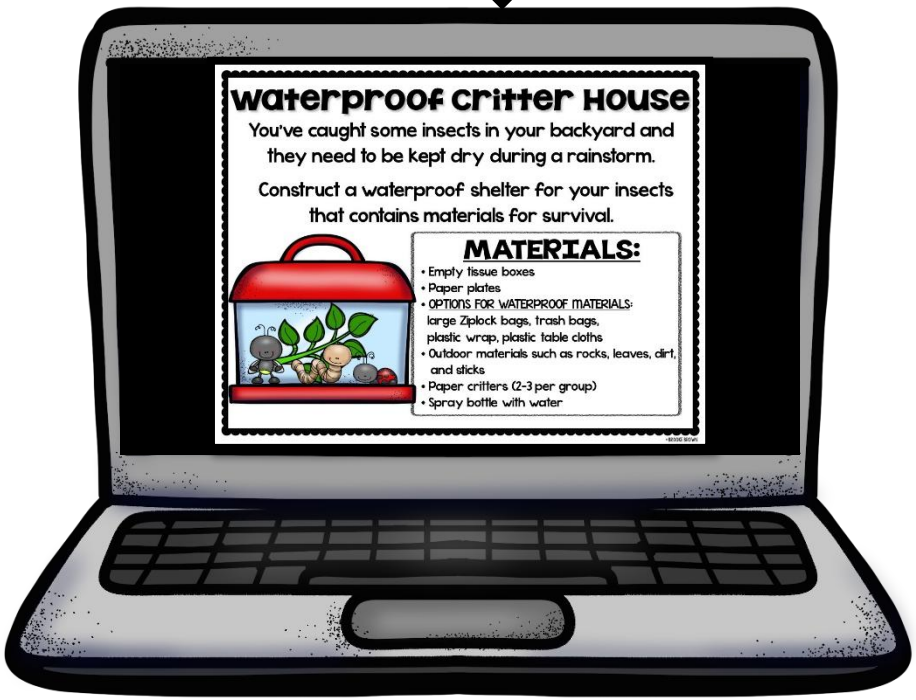

LET'S REFLECT!

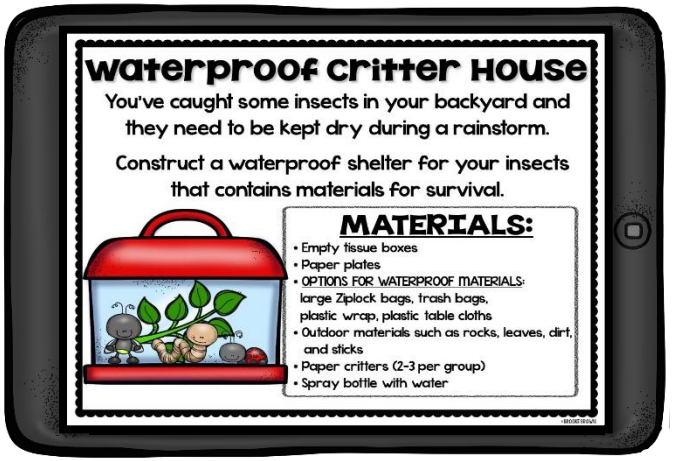
- What was most difficult about this challenge?
- How did you design your critter house to be a good habitat for your insects?
- What types of items did you include in your critter house to help your insects survive?
- Which waterproof material was most effective and why do you think so?
- What types of waterproof materials do you find on real shelters?
- What are some waterproof materials that are found in nature or animal coverings?
- If we completed this challenge again, what would you do differently next time?

Optional Google Slides Notebook

1. Download Link for the Google Slides Notebook.
2. Sign into your Google Account.
3. MAKE A COPY of the notebook.

Each student will need their own Google account if they will be working on their own Digital Interactive notebook using Google Slides. If your students will be using iPads, they will also need to download the Free Google Slides App for the digital notebook to work properly.





Before you and your students begin editing/filling in your digital notebook, it is VERY important to first save a copy of the file on your own Google Drive, and then edit the copy. Your students will follow these same steps when you share the file with them.

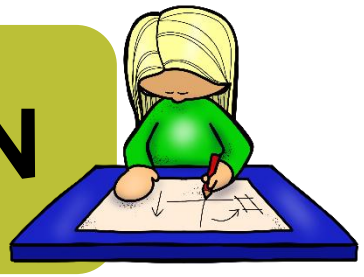
YOU DO NOT WANT YOUR STUDENTS TO EDIT THE ORIGINAL FILE.

THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



CREATE

TEST & IMPROVE

REFLECT & PRESENT

SUPPLIES CHECKLIST

STEM CHALLENGE	ITEM	NUMBER PER GROUP	I HAVE IT
Waterproof Critter House	empty tissue box	1	
	OPTIONS for waterproof materials: gallon ziplock bags, trash bags, plastic tablecloths, plastic wrap	variety	
	paper plates	1	
	scissors	1	
	tape	3 feet	
	mini cups with paper critters taped to the front	1 set	
	spray bottle with water	1	

STANDARDS ALIGNMENT

CHALLENGE	ENGINEERING	SCIENCE	MATH
Waterproof Critter House	K-2-ETS1 Engineering Design: K-2-ETS1-1, 3-5 ETS1-2, 3-5 ETS1-3 3-5-ETS1 Engineering Design: 3-5-ETS1-1, 3-5 ETS1-2, 3-5 ETS1-3	K-LS1 From Molecules to Organisms: Structures and Processes K-ESS2 Earth's Systems 1.Structure, Function, and Information Processing 3-LS4 Biological Evolution: Unity and Diversity 3-ESS3 Earth and Human Activity	MP1: Make sense of problems and persevere in solving them MP.2: Reason abstractly and quantitatively MP.4: Model with mathematics MP.5: Use appropriate tools strategically

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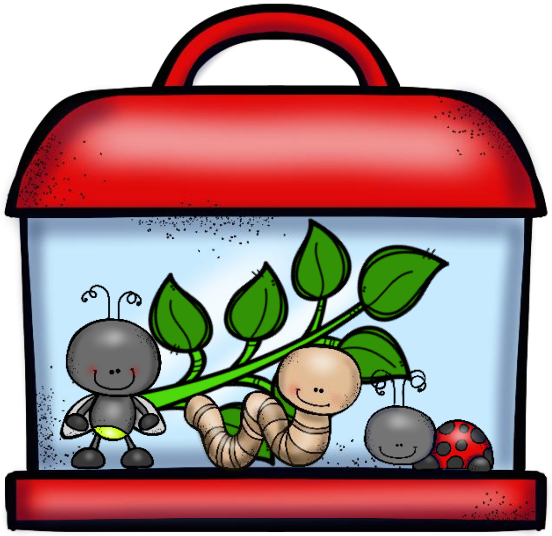

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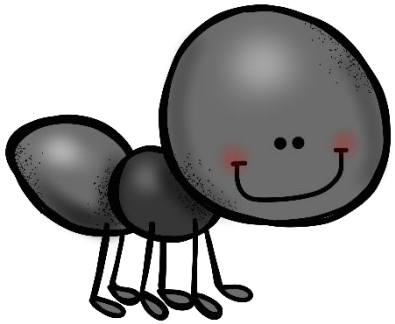
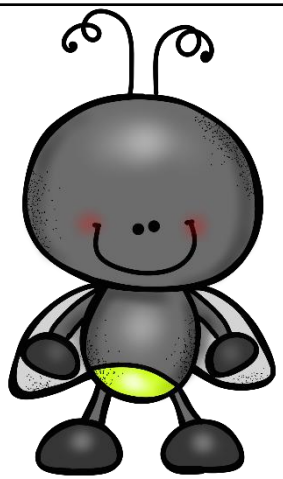
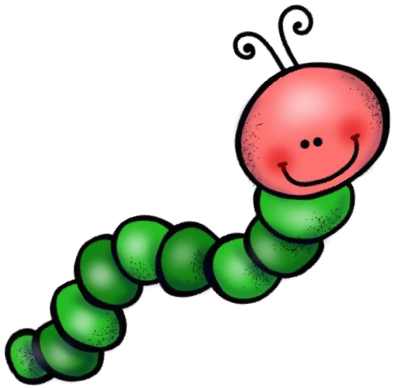
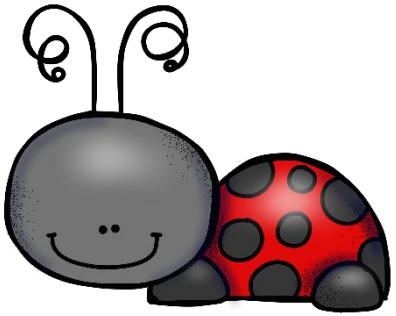
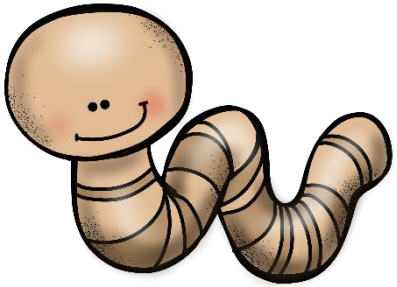
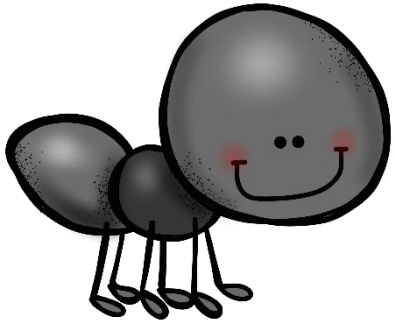
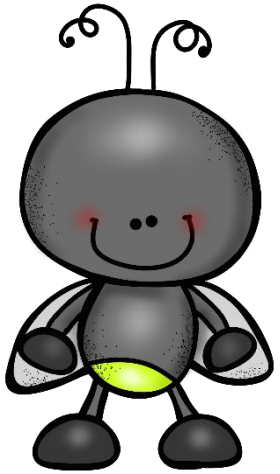
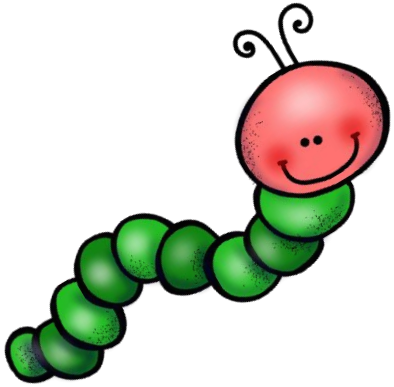
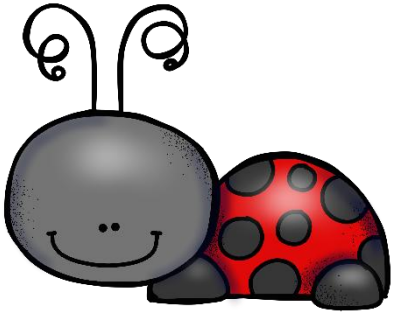
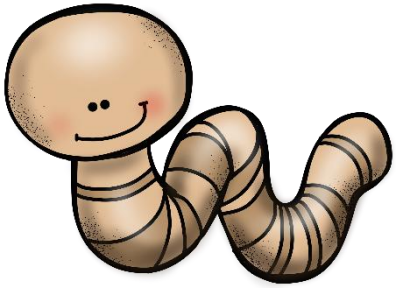
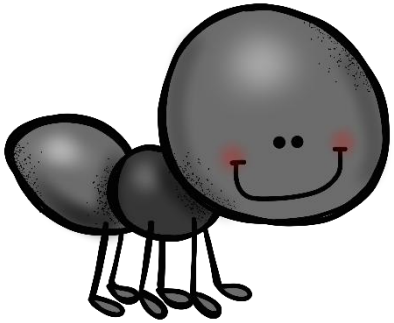
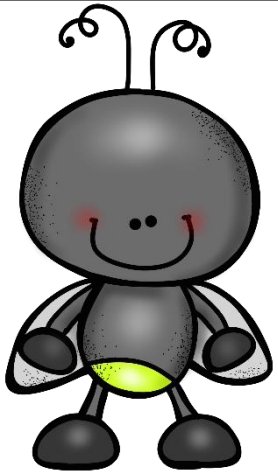
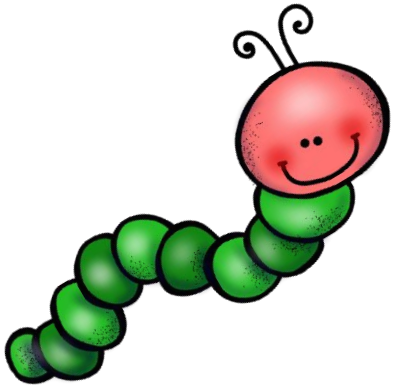
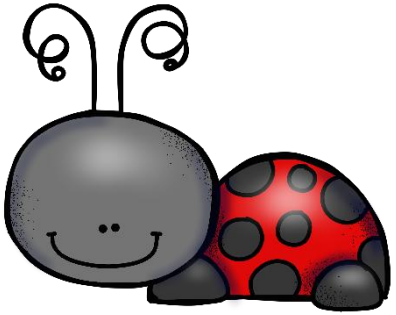
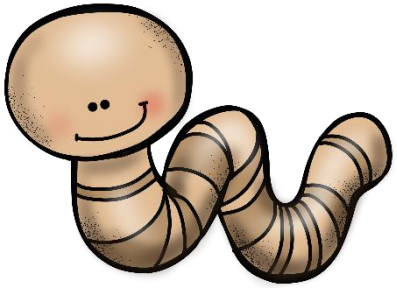
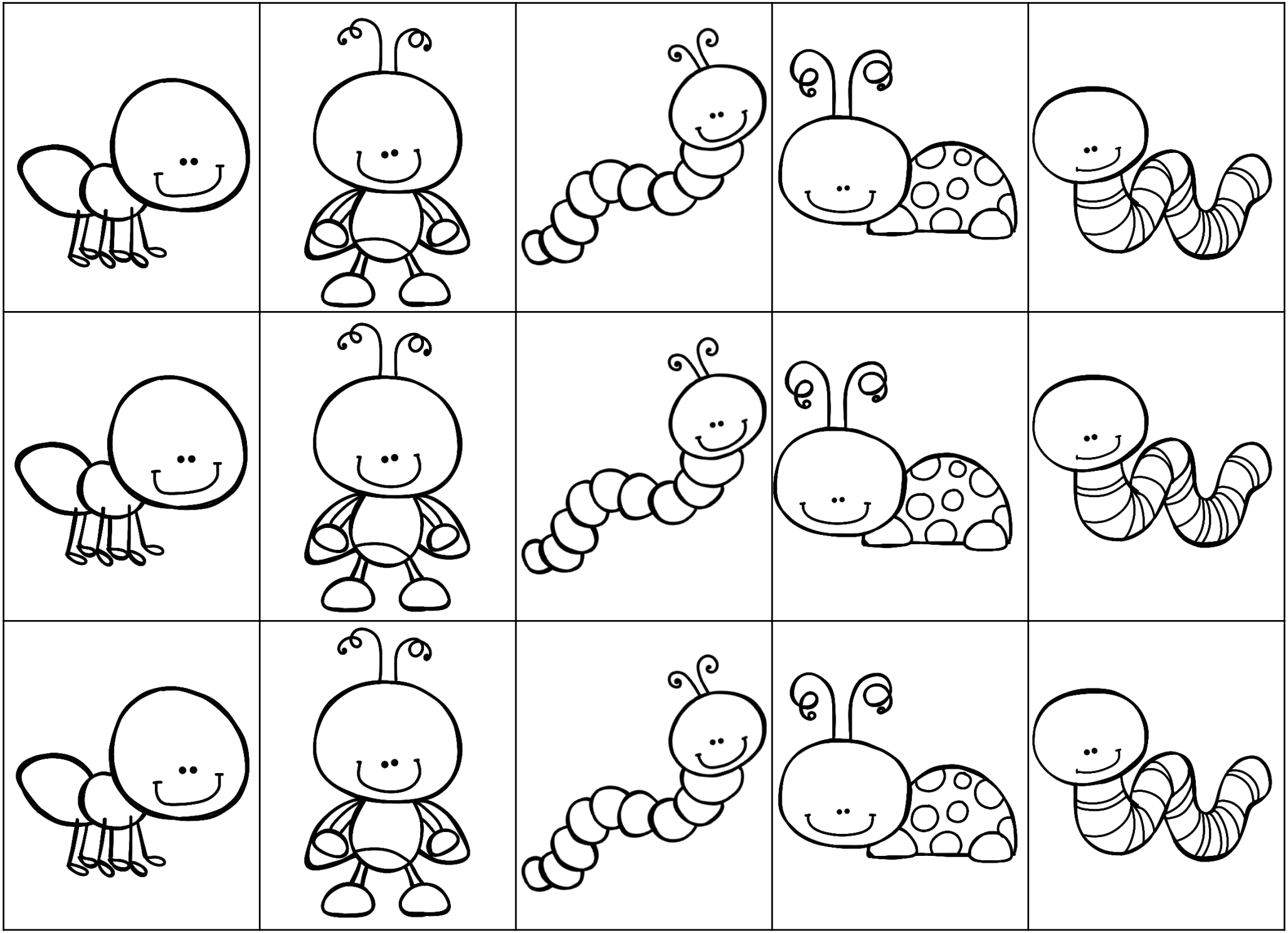
critters

critters



Waterproof Critter House

POSSIBLE PRODUCT

(for teacher reference only)

Waterproof Critter House

You've caught some insects in your backyard and they need to be kept dry during a rainstorm.

Construct a waterproof shelter for your insects that contains materials for survival.

MATERIALS:

- Empty tissue boxes
- Paper plates
- OPTIONS FOR WATERPROOF MATERIALS:
  large Ziplock bags, trash bags,
  plastic wrap, plastic table cloths
- Outdoor materials such as rocks, leaves, dirt, and sticks
- Paper critters (2-3 per group)
- Spray bottle with water

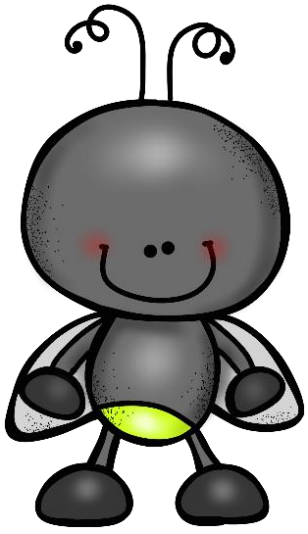
EXPLORE INSECTS

INSPECT AN INSECT

UNDER A ROCK

BUG HUNTING GAME

10 INTERESTING INSECTS



Waterproof Critter House

REAL WORLD EXAMPLES

What is similar? What is different?

Types of Insects

Where Insects Live

What Insect Homes Need

WORDS TO KNOW

shelter

a dwelling
or home
designed
for protection

terrarium

a clear
container that
houses plants,
insects, reptiles,
or amphibians

waterproof

unable to
be penetrated
by water

habitat

the natural home or environment
of a plant or animal

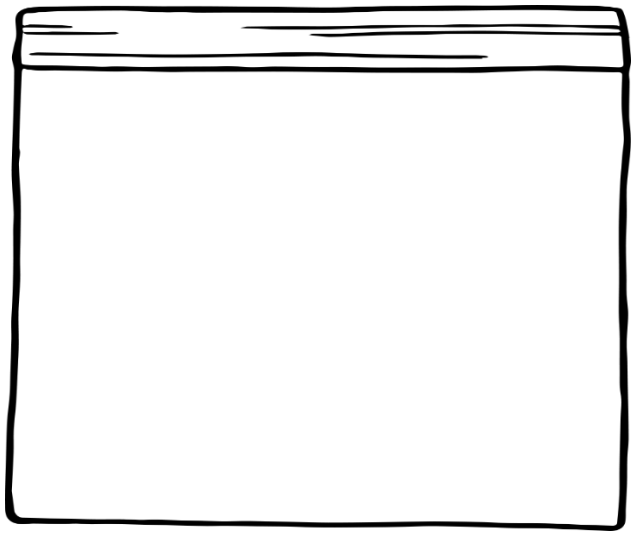
Waterproof Critter House

Name: _____

MY BLUEPRINT

Draw a picture of your critter house.

Draw the objects that you found outside for your habitat.



Draw the insects that you put inside your critter house.

Is your critter house WATERPROOF?

YES NO

Waterproof Critter House

Name: _____

BLUEPRINT

What objects did you gather outside for your insect habitat?

Which materials did you use to make your critter house waterproof?

Did your shelter stay dry when you sprayed it with water?

YES NO

How could you improve your shelter to make it an ideal habitat for insects?

LET'S REFLECT!

- What was most difficult about this challenge?
- How did you design your critter house to be a good habitat for your insects?
- What types of items did you include in your critter house to help your insects survive?
- Which waterproof material was most effective and why do you think so?
- What types of waterproof materials do you find on real shelters?
- What are some waterproof materials that are found in nature or animal coverings?
- If we completed this challenge again, what would you do differently next time?

STEM Challenge Assessment Rubric

Challenge: _____

Date: _____

Student Name: _____

3	2	1
Student followed all instructions for challenge.	Student followed some instructions for challenge.	Student did not follow instructions for challenge.
Student used best effort and perseverance on challenge.	Student used some effort and perseverance on challenge.	Student did not show effort or perseverance on challenge.
Student completed assigned blueprint and reflection sheet.	Student partially completed assigned blueprint and reflection sheet.	Student did not complete assigned blueprint and recording sheet.
Student showed accuracy in testing, calculating, and measuring.	Student showed some accuracy in testing, calculating, and measuring.	Student did not show accuracy in testing, calculating, or measuring.
Student fully cooperated with group members and contributed fairly.	Student partially cooperated with group members and contributed fairly.	Student struggled to cooperate with group members and/or failed to contribute.
Student fully participated in class discussions.	Student somewhat participated in class discussions.	Student did not participate in class discussions.

TOTAL POINTS: _____ /18

Comments: _____

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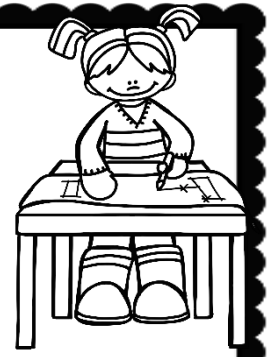
We Need STEM Supplies!



Dear Families,

We are learning all about Science, Technology, Engineering, and Math through STEM lessons, and we need your help! If you are able to donate any of the following supplies for our STEM Challenges, please detach and return the form below and send back to school with your child. We greatly appreciate your support and generosity!

We are in need of the following items by _____.

Thank you so much for helping to make our STEM lessons possible!
Please contact me at _____ with any questions.

Sincerely,

_____

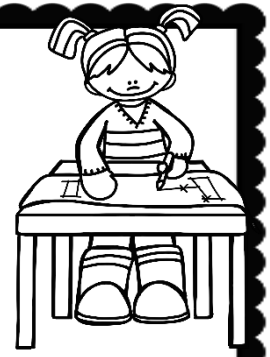
If you are able to donate, please detach and return the form below:

Parent Name(s): _____

Child's Name: _____

I am able to donate: _____

We Need STEAM Supplies!



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I am able to donate: _____

Credits

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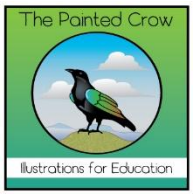

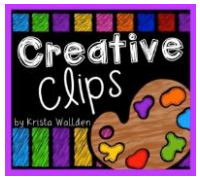

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