

STEM Backpacks

Ann O'Connor and Julianna Thrasher

What is 4-H Stem to Go?

MO 4-H STEM To Go is an initiative to provide quality STEM programming to families that can be completed at their convenience.



Learning Outcomes

- Spark interest in STEM for youth
- Provide meaningful experiences about STEM
- Develop college and career readiness skills
- Recruit new audiences to 4-H
- Increase the likelihood that youth pursue STEM careers
- Provide families with educational opportunities

Explore the STEM Backpacks

Missouri 4-H Pilot:

- Pollination*
- Soil*
- Chemistry*
- Recycle
- Luminescence
- Magnets

More in progress

***Lower cost**

Nebraska 4-H:

- Water
- DNA*
- Engineering x2
- Plants
- Volcano
- Bugs
- Pollinators
- Food For Animals
- Butterfly
- Yeast

Also in Spanish

Activities - STEM Backpacks

Contents for each backpack

- Lesson plan/Guide sheet
- Books/Articles for different age groups
- Discussion questions
- Songs
- Videos
- Games
- Models
- Supplies for the activities

Preparation and Cost

Estimated Cost:

- Backpacks vary in cost. Estimated cost: \$50-\$100 for books and initial supplies
- Minimal cost to replace consumable supplies

Preparation:

- 15-60 minutes (depending on backpack)

Logistics:

- Storage of supplies
- Refilling the consumable supplies

What are Stem Backpacks?

- Purpose of Backpacks
- Goals
- Contents
- Age Levels



Age Levels of Activities

Lower Elementary	Upper Elementary	Middle School
All about tornadoes	Butterfly metamorphosis	Junk drawer robotics
Cloud in a jar	Food for animals	The magic of yeast
Erupting volcano	Pollinators - BEE mine	Engineer It
How plants grow	DNA	Bugs and more bugs

Backpack Activity

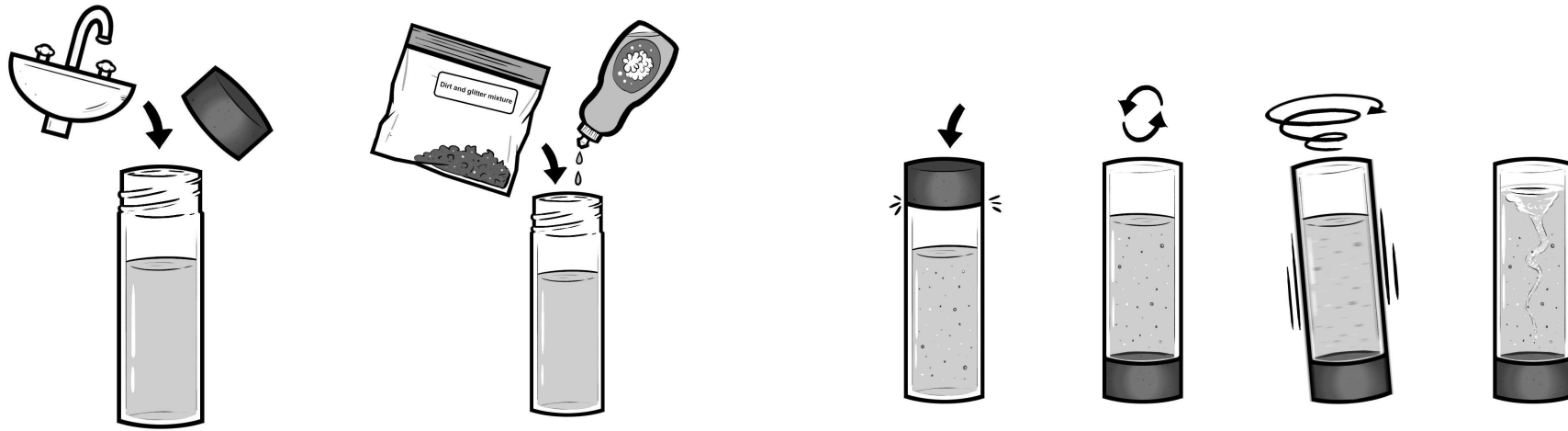
- Follow the instructions for the activity and complete

Food for Animals Activity

- Follow the instructions for the activity and complete
- When finished dispose of owl pellet in trash
- Complete feedback survey

Debrief about Activities

1. Do you think the families you serve could do these activities with the instructions given?
2. What suggestions for improvement do you have?
3. Would illustrations help make instructions clearer? If so, where would you put the instructions in relation to the text?



Nebraska's Evaluation Results

Nebraska's data focuses on improvement for the backpacks.

- Overall rating (1-5 scale): 4.81
- Increased family engagement and enjoyment of reading
- Families have reported spending an average of 69 minutes engaged in activities and 37 minutes reading for a total of 93 minutes of time spent engaging with each backpack
- Currently have 379 backpacks in libraries, afterschool programs, Extension offices, daycare programs, afterschool programs and family literacy groups

New Backpacks being piloted

- Starry Skies
- Animal Tracks
- Photosynthesis
- Electricity
- All About Leaves
- Slime
- Renewable Energy

New in 2024

- Increase accessibility by adding illustrations for at least 8 of the activities
- Added videos to some of the backpacks
- Added QR codes for more information or to view videos
- Digital library of books for ages 2-8
<https://www.uniteforliteracy.com/bsbne/library>
- Adding books for older readers to the six backpacks that currently have only two books
- Ability to offer refills if sites don't have capacity to make refills themselves
- Unite for Literacy books



Unite for Literacy Books

uniteforliteracy.com/bsbne/library

BSB project Family Engagemen... Click2CS Click2Engineering Career and College... Click2Science STEM CARES 2023 PD modules curricu... Links that support... f_20.pdf Employee Informat... Making the Connec... Luminarium BSB Engineering Pa... Reporting 4-H Backpacks Courses to Complete New folder All Bookmarks

Growing Plants

- Which One Grows the Fastest?
- Jack O'Lanterns from Start to Finish
- Where Do They Grow?
- The Life of a Seed
- Dandelion Days
- Garden Giants
- Let's Grow!

Gardens and Farms

- Gregory's Great Farm Adventure
- VEGETABLE GARDEN OF RAINBOWS
- Container Gardening
- Tools for Gardening
- A Strawberry's Best and Worst Neighbors
- Farm Tractors at Work
- Fresh from the Farm
- A Garden for Me
- O. McDonald Has a Farm

Insects

- Garden Guardians
- Do You Like Bugs?
- All Kinds of Ladybugs
- The Busiest Bugs I Know
- Monarchs and Milkweed
- The Busy Bee
- Worms in the Garden

Food

- APPLES To Table from Tree
- Milk for Me
- I Can Eat a Whole Plant!
- Let's Make A Snack
- Bread for Everyone
- Let's Make Salsa
- Let's Make Snow Ice Cream

Energy and Environment

- Our Electricity
- Renewable Energy Is All Around Us
- The Prairie
- Let's Be Energy Friendly!
- Where Do You Live?

Apply to get a set of 6 Backpacks

- Scan QR code to apply to get a set of 6 backpacks to use at your site for no cost to you (except for refills).
- There will be two sets of backpacks that I will have for pick up tomorrow by noon. You can pick them up at the registration desk. I will let you know by 10 am tomorrow if you are one of the people who can pick up a set.
- Will ship the rest within the next month.



Missouri 4-H Pilot

- Rolla and St. James libraries
- Checkout for a maximum time of 2 weeks
- Evaluation from families is being collected
- Group enrollment

Missouri-Nebraska Partnership

- What we have learned
- Challenges
- Opportunities

Questions

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