

WISE Activity Booklets

A STEM activity booklet for fun on-the-go learning!
Made by WISE Kid-Netic Energy



DIY Activities
Puzzles
Challenges
... and more!



University
of Manitoba

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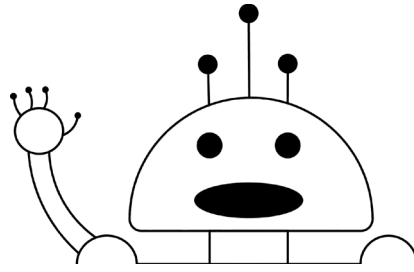
With funding from

Canada

Grade 3

AUGUST 2020

Growth and changes in plants - Soils in the environment - Forces that attract and repel - Materials and structures



Hello there!

WISE Kid-Netic Energy is a not for profit STEM (Science, Technology, Engineering, and Math) outreach organization at the University of Manitoba. Our organization offers science and engineering workshops, clubs, camps and events to youth from Kindergarten to Grade 12 throughout the province of Manitoba. We reach on average 25 000 to 50 000 youth depending on funding levels. Our approach is simple – present STEM in messy, memorable and engaging ways so Manitoba youth feel motivated to learn more and more. We reach all Manitoba youth, and we particularly target underrepresented youth like girls, indigenous youth and youth facing socio-economic challenges.

All of us at WISE Kid-Netic Energy have been working hard to create these booklets to continue to bring our fun and educational STEM activities to Manitoba youth during these unprecedented times. We are disappointed that we cannot see you in person, and hope that these monthly booklets bring some STEM excitement to your life.

These booklets have been created by our student instructors who are all studying engineering, science, or in another STEM-related field at university. Peek the next page of this booklet to see who created the activities, experiments and recipes within.

All the activities in this booklet are based on the Manitoba Science curriculum. For any teachers viewing this booklet, all the SLO codes are listed at the bottom of each page.

We hope that you enjoy doing the experiments and activities as much as we loved creating them for you.

In this Grade _ booklet, the science topics you will be exploring are: growth and changes in plants, soils in the environment, forces that attract and repel, materials and structures and more!

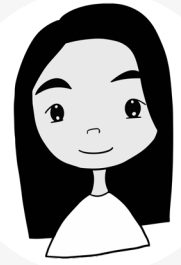
**Best of luck, and until we see you again,
the WISE Kid-Netic Energy Crew**

P.S. If you have any suggestions for activities or experiments you would like us to try, contact us through our website, or social media accounts that are listed on the last page of this booklet.

Meet our Amazing Authors!

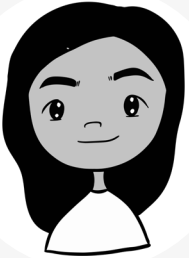
Amaris

Amaris just finished her first year in sciences at the University of Winnipeg and plans on majoring in biology. In her free time, Amaris likes reading, playing piano and baking.



Gagan

Gagan is a fourth-year BSc Honours Student in the Department of Psychology. She enjoys being creative and loves to learn! In her free time, she likes to try new things, read, and grow plants.



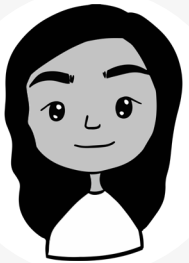
Huda

Huda is in her first year taking general science courses and she's trying to decide between a degree in Microbiology or Genetics. She enjoys baking and cooking and her favorite activity is watching videos on YouTube!



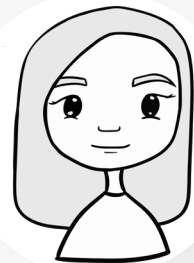
Kajal

Kajal just finished her first year of Computer Science and is pursuing a Bachelors of Computer Science. She loves to read, sketch, and make things. She is excited to visit new places across Manitoba and work with kids!



Sophia

Huda is in her first year taking general science courses and she's trying to decide between a degree in Microbiology or Genetics. She enjoys baking and cooking and her favorite activity is watching videos on YouTube!



Esiw the Robot

Esiw is a friendly robot that loves to help kids learn about computers & coding! Esiw loves to do math, solve problems and make people laugh!

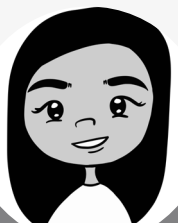


... and our Incredible Editors!

Alex



Bea



Mahalia



Michelle

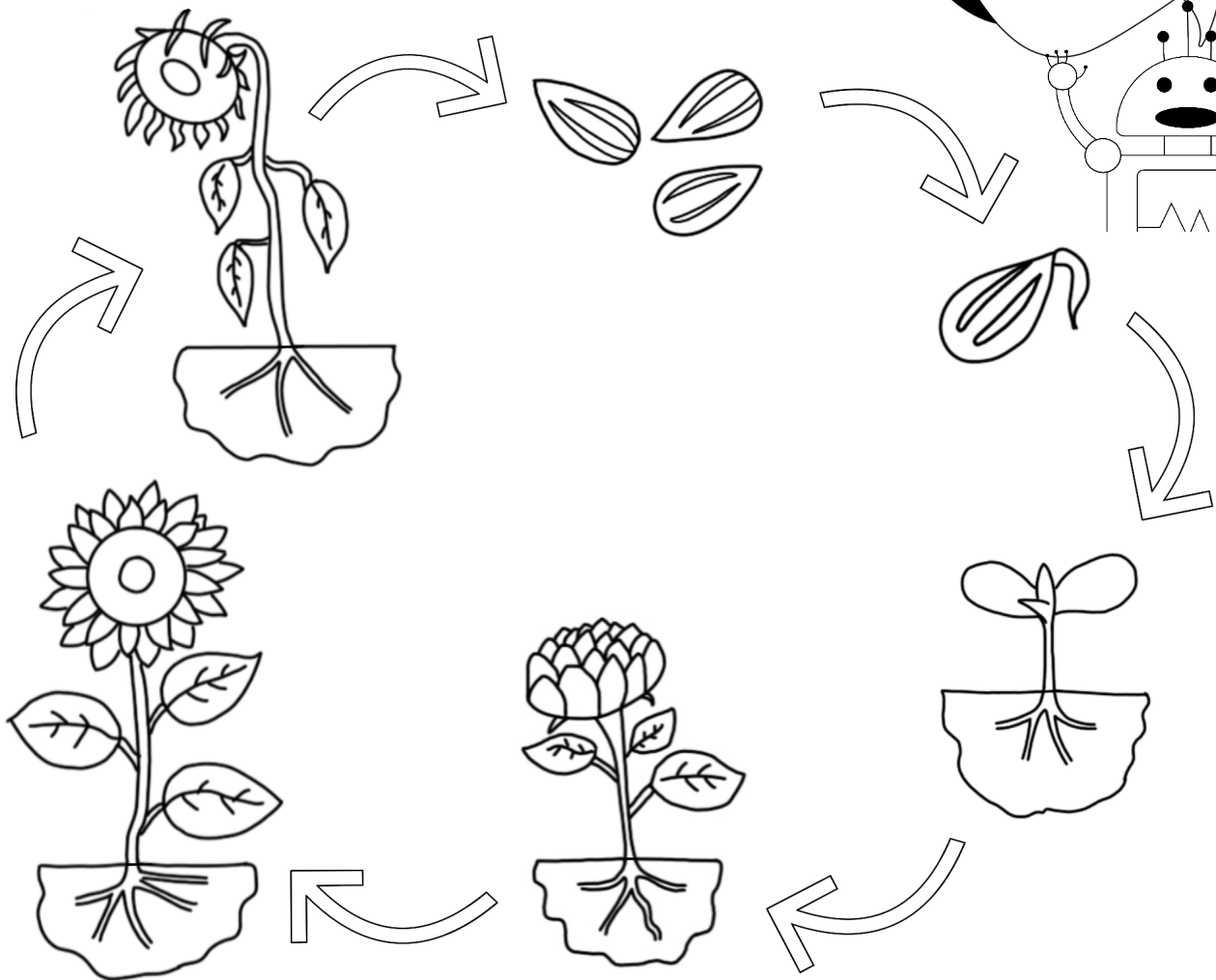
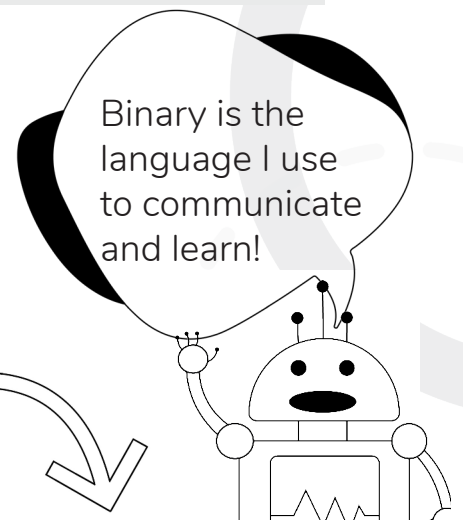


Life Cycle of a Plant

This is the lifecycle of a sunflower! Using the key below, colour in the cycle!

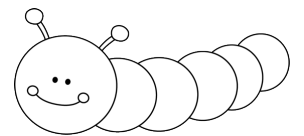
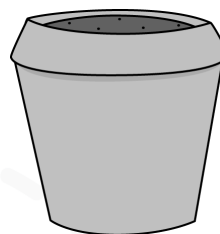
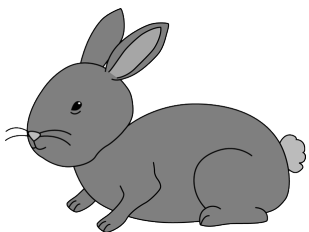
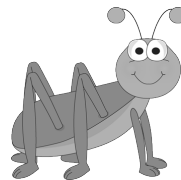
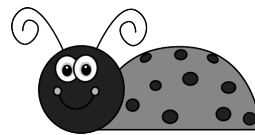
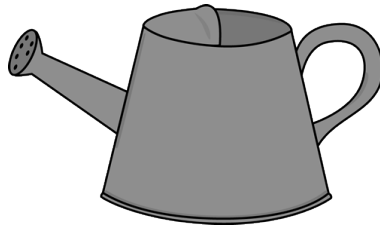
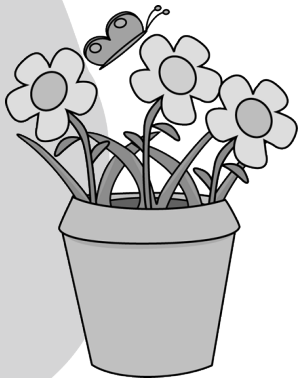
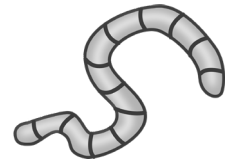
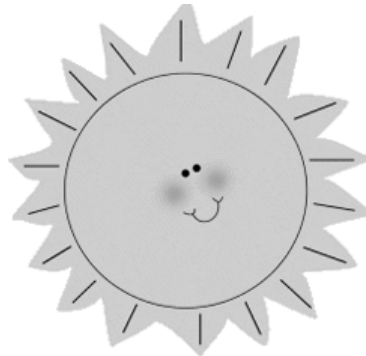
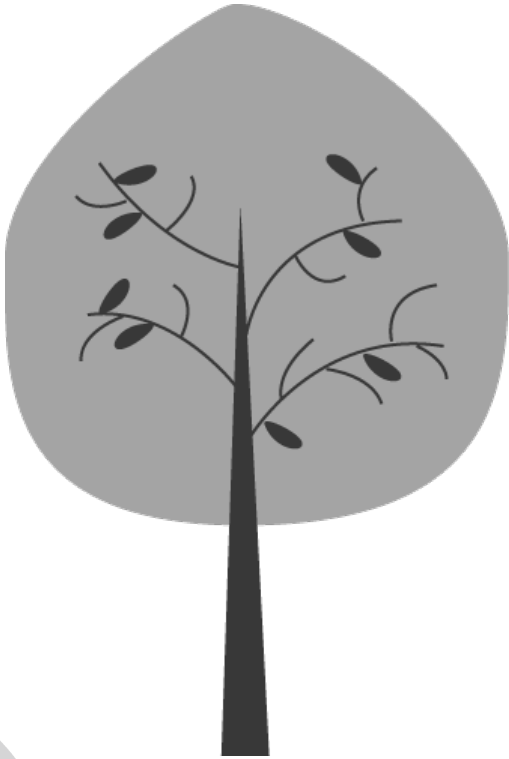
- Colour the sunflower seeds and the smaller circle on the flower 000
- Colour the arrows 001
- Colour the soil 010
- Colour the leaves and stem, as well as the two plants without a flower 011
- Colour the bigger outside circle on the flower 100
- Colour the petals on the flower 101
- Leave the roots white!

Colour	Black	Blue	Brown	Green	Red	Yellow
Binary	000	001	010	011	100	101



_____’s Garden

Cut out the items below that are good for a garden and paste them on the next page to design your own thriving garden! Make sure you cut out the items that help your plants to grow and avoid things that are bad for your plants.



This page is intentionally left blank, because the previous page is meant to be cut up.

Add to the garden space here!



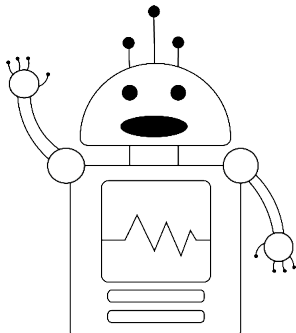
Connect the Dots

Follow the numbers and connect the dots on the next page to reveal an image of the Greek Parthenon.

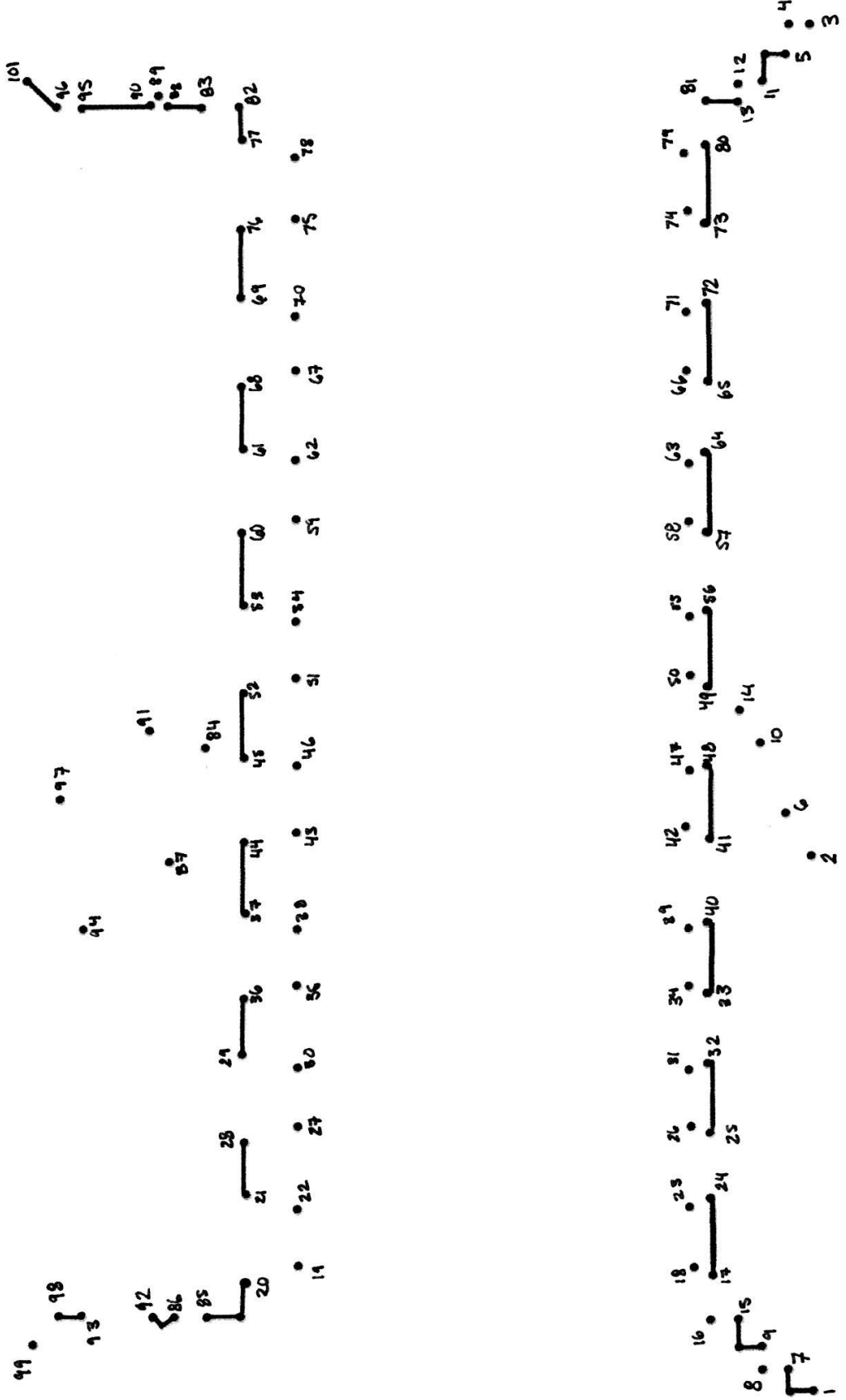
The Parthenon was built from 447 to 432 B.C. making it almost 2500 years old! It remains standing after so long because it has a very strong structure and the builders used shapes that can hold a lot of weight. One of the most prominent features of the Parthenon is its many columns. While columns were a common defining design of ancient Greece, they're also structurally strong. When a weight is applied to a column, it distributes the weight from the upper parts downward to the lower parts of the structure and eventually to its foundation. Since columns are continuous shapes there aren't many places where it can easily break.

The top of the Parthenon is triangular. Triangles are also a common structural shape because they can withstand a lot of weight. Their shape can't be changed easily, making them very strong.

Did you know, connect the dots is like a computer science element called a linked list. In a linked list, is a collection of data elements that must follow a specific order. Each Element directs the code to the next element similar to how one number leads to the next in a connect the dots picture.



100 •



Photosynthesis Experiment

Have you ever wondered how plants get the food and nutrients they need to grow?

Plants get their energy from water and carbon dioxide. The plant uses sunlight to convert the carbon dioxide and water into sugar for energy. Oxygen is also released as waste. This process of plants getting energy from the sun is called photosynthesis (photo = light, synthesis = the combination of things).

There's an equation to represent this process that may make it a little easier to understand:

Water + Carbon Dioxide ----- Sunlight -----> Sugar + Oxygen

Try out this experiment to observe plants producing oxygen:

Materials

- Freshly picked weeds
- Water
- Clear container
- Rock to weigh the plant down

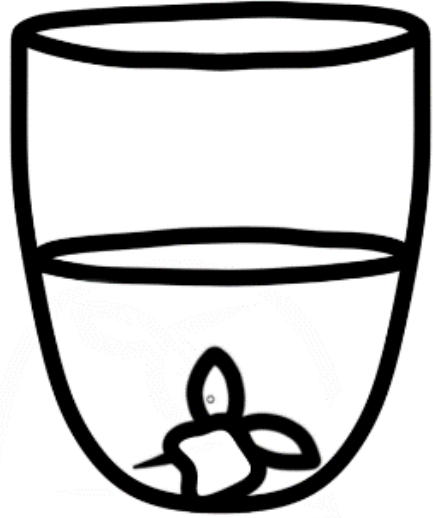
Instructions

Collect some weeds and place them inside a clear container.

Fill the container with water, 3/4 full.

Leave the container with the weeds in a sunny spot for 1-2 hours.

Your container should look like this -->



Observations

Write down your observations: what did you see in the container?

You should see some bubbles forming on the leaves and on the edges of the container. The bubbles are from the oxygen produced through photosynthesis by the weeds.

Forces in my House

A force is a



PUSH or a



PULL

Some types of forces act over a distance.

These are called

REPULSION

and

ATTRACTION



This is like pushing!



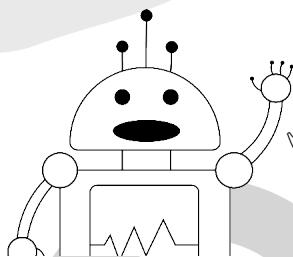
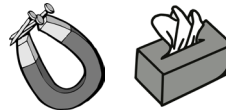
This is like pulling!

Think of your whole day so far. Can you draw the different forces around your house. Circle the ones that are attraction or repulsion!

PUSH



PULL



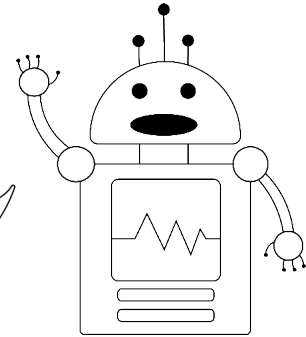
Did you know that these are called Boolean because there are exactly two options. Push or pull, attraction or repulsion.

What can you do with magnets?

Magnets can be super helpful and useful in everyday tasks. But using magnets on some items can be super harmful.

Look at the list of household items below. Esiw needs your help deciding if they can or can't use a magnet on them.

Since I only read code, can you tell me if I can't use magnets using **binary**? In **binary code**, 1 means true and 0 means false. Write a 1 for can and 0 for can't next to each item to help me!



Credit or Debit Card

Computer Hard Drive

Fridge

Screw

Earring

Television

Toy Train

Laptop

Smart Phone

Pacemaker

Metal Nails

Structure Services

Esiw is looking at jobs in the construction field but can't figure out which job belongs to which tools on the next page. Can you give Esiw a hand by circling all the images that can be used in each of these jobs?

Want to challenge yourself? Try circling the tools on page 15 with different colours! (ex. yellow for construction, blue for architectural jobs and red for engineering) Hint: some jobs use the same tools!

Construction jobs are all about building, improving and fixing spaces to make them safe and functional.

Elevator Mechanics work to ensure the safety and smooth functioning of moving walkways, elevators and escalators.

Construction workers have many jobs, some of them include working with heavy equipment, loading and unloading building materials, and extracting debris.

Carpenters work with wood to build many things like cabinets, thermal insulation to keep homes warm during winter and creating frames for homes.

Architectural jobs specialize in planning, designing, and reviewing the construction of buildings.

Drafters are tasked with converting engineering and architectural designs into technical drawings to help with the building process.

Interior designers create functional and safe spaces for people to live, work and play in.

Urban and regional planners establish good uses for land that create communities and account for changing population numbers. As well as create nicer spaces in countries, cities, and towns.

Engineering jobs are about creating things and solving complex problems.

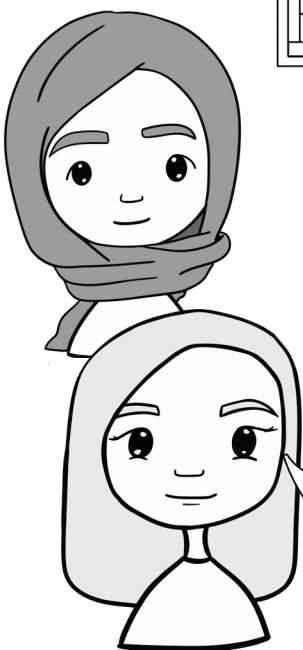
Computer engineers use programming to develop, create, and test software and hardware that allows computers to work. They can work with developing software like Windows or hardware like the graphics card on a computer.

Marine engineers construct structures that are used on and under the surface of water, such as oil platforms, cruise ships and submarines. They ensure that these structures are working properly.

Automotive engineers research, design and develop vehicles like cars, trucks and motorcycles. They design vehicles to be safe and functioning.

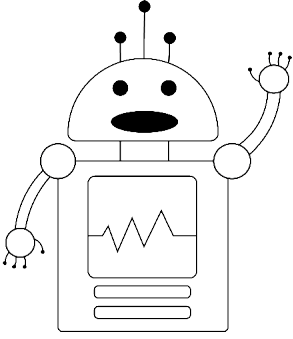


Huda and Sophia want to tell you about a few BIPOC (Black Indigenous, People of Colour) women that have worked in professions of engineering and architecture!



Ursula Burns is a mechanical engineer, she graduated university and worked her way up and become the first African American CEO of a fortune 500 company! Beverly Loraine Greene became the first African American women licensed to practice architecture in Illinois and in the USA. She was part of the team that designed the UNESCO Headquarters in Paris!

The ground beneath the farm



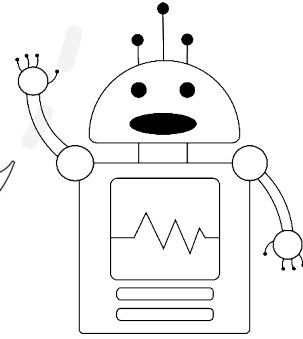
Esiw is trying to complete the mad lib on the next page but needs help coming up with some words. Can you give Esiw a hand?

Fill this page and then use the words you come up with to complete the mad lib on the next page!

1. Name of a City: _____
2. Person's Name: _____
3. Number: _____
4. Verb (3rd person present, example: she waits and watches. an 's' or 'es'):

5. Two words, Verb (ing): _____
6. Noun (plural): _____
7. Noun (plural): _____
8. Noun (plural): _____
9. Adjective: _____
10. Number: _____
11. Adjective: _____
12. Noun: _____
13. Noun: _____
14. Verb: _____
15. Noun (room): _____
16. Verb: _____

Can you add in the words you came up with on the previous page below. Make sure they are in order!



“Good morning (1) _____! My name is farmer (2) _____ and I am here to tell you a little bit about the magic of soil.”

“On my (3) _____ acre farm, I (4) _____ using soil. There are many types of soils that can be used for (5) _____.

Loamy soil, which is most fertile, is best for growing (6) _____.

Clay soil, best known for how well it can hold water, is greatest for growing (7)

_____, and sandy soil, although (8) _____, is useful for plants that grow well in warm areas.”

“On my farm, I have about (9) _____ bags of soil.”

“In soil, there are 4 major components. 1. Water, 2. (10) _____ Rocks, 3.

Air that helps organisms (11) _____, and 4 organic material made up of

dead (12) _____ and (13) _____ that forms humus.”

The best thing to do with soil is (14) _____ it. This is because it ensures

the soil lasts a while on the farm. It is also important to sieve the soil at times,

something similar to what you would do in the (15) _____ with flour. But

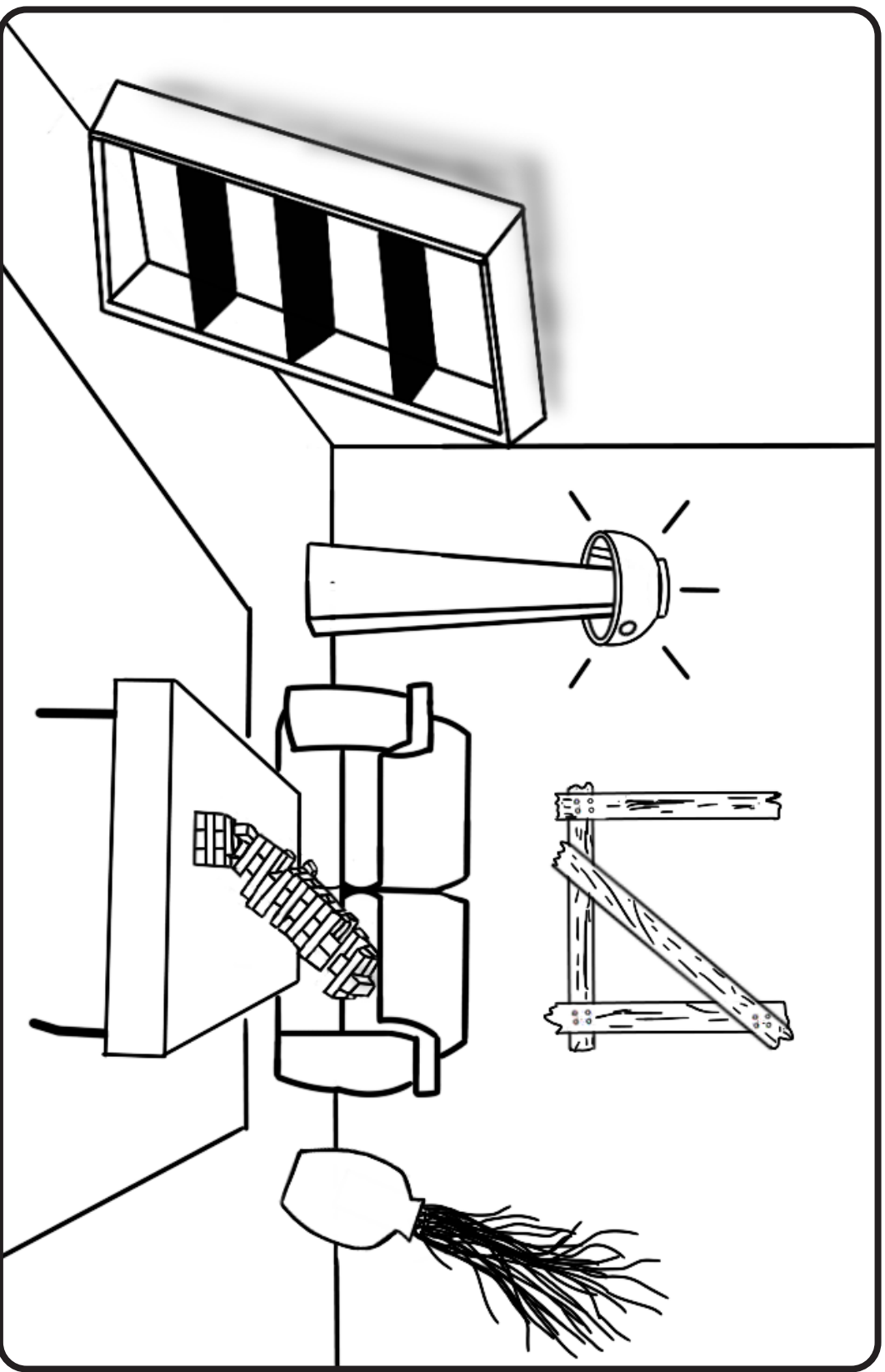
as all things come to an end, when sedimentation occurs to my soil, it makes me

want to (16) _____.

Spot the structural errors!

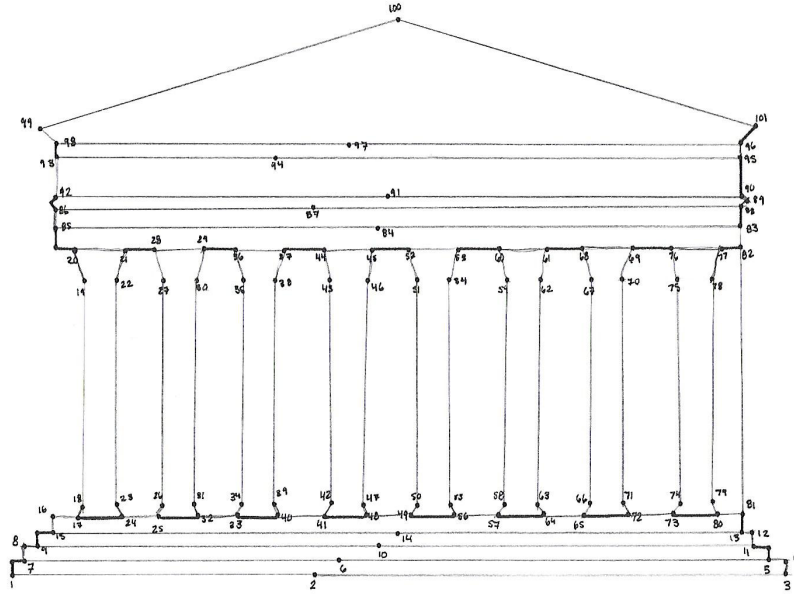
For the picture below, circle **six** areas in the living room with structural problems. For each problem propose a solution to fix the error.

Note: There can be more than one solution to fix each problem.



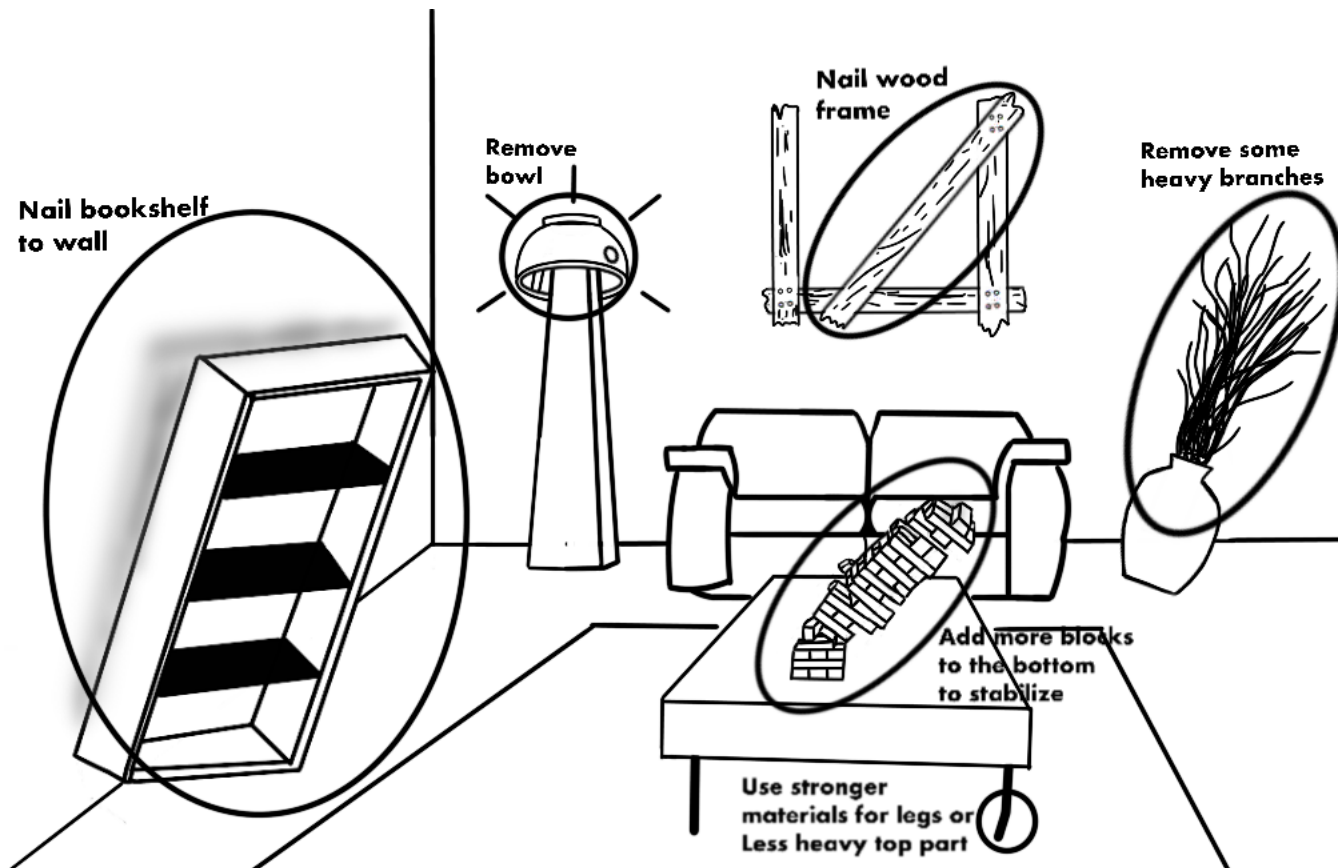
Answer Key

Page 9:

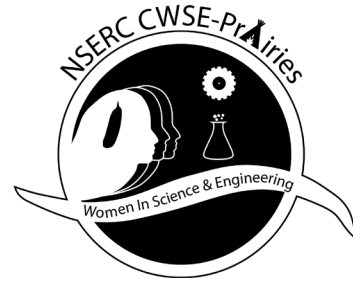


Page 13: 1: Fridge, Screw, Earring, Toy Train, Metal Nails. 0: Credit or Debit Card, Computer Hard Drive, Television, Laptop, Smart Phone, Pacemaker

Page 18:



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