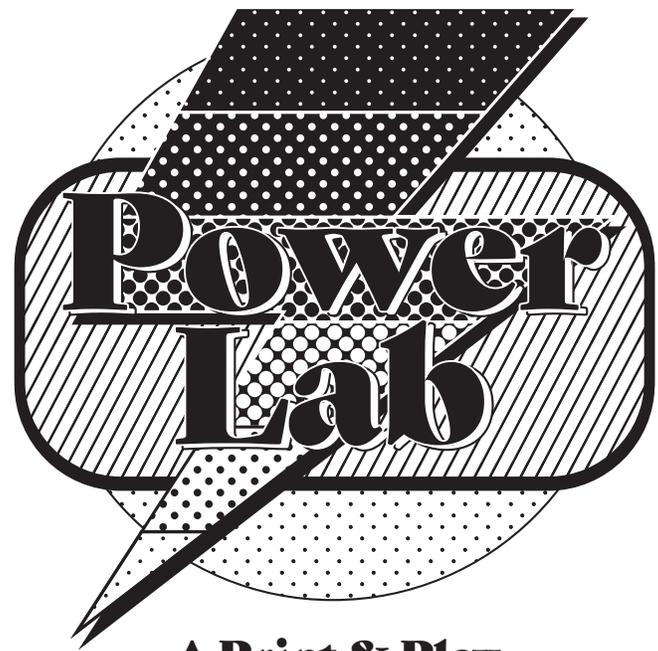
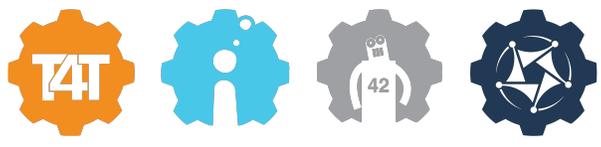




TWO BIT CIRCUS

FOUNDATION

· INVENTING INSPIRATION ·



**A Print & Play
Puzzle Experience**

Introduction



Hello There!

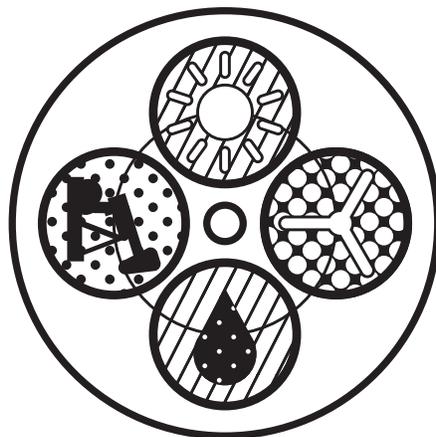
My name is Dr. Fritz. Welcome to my Power Lab! Here we can learn about all kinds of energy sources and the power they provide.

I have four Power Lab challenges set up for you today. Complete them all to become a certified Power Lab Pro! Make sure to read your lab sheets for important information and don't be afraid to ask for help along the way.

I've hidden these Power Lab challenges at stations around your house. Follow the clues to find them, solve the challenges at each station, and report back to your Lab Assistant to get the next clue.

What are you waiting for? Let's get started!

- Dr. Amelia Fritz



Oil Power

Oil comes from deep underground
Stack the layers of the earth
to find the code



B

U

R

N

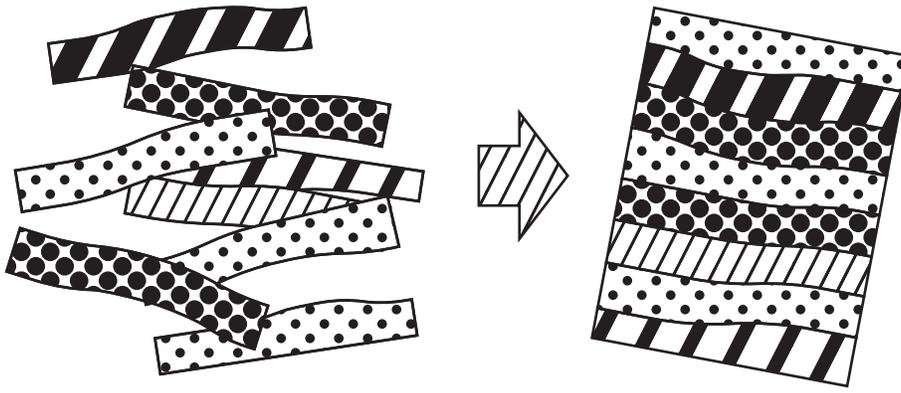
I

N

G

Oil Power

Lab Sheet 1



Stack the strips in the right order to spell the special codeword.

Show the codeword to your Lab Assistant for the next clue!



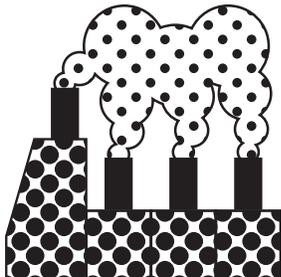
Organic material including prehistoric plants and fossils are trapped underground for millions of years.

Under tremendous pressure and the right conditions it can turn into coal, oil, or organic gas (fossil fuels).



We can extract these fossil fuels from deep under the ground using drills, pumps, or mines.

Oil based fuel is non-renewable, once we dig it all up from the ground we will not have any more.

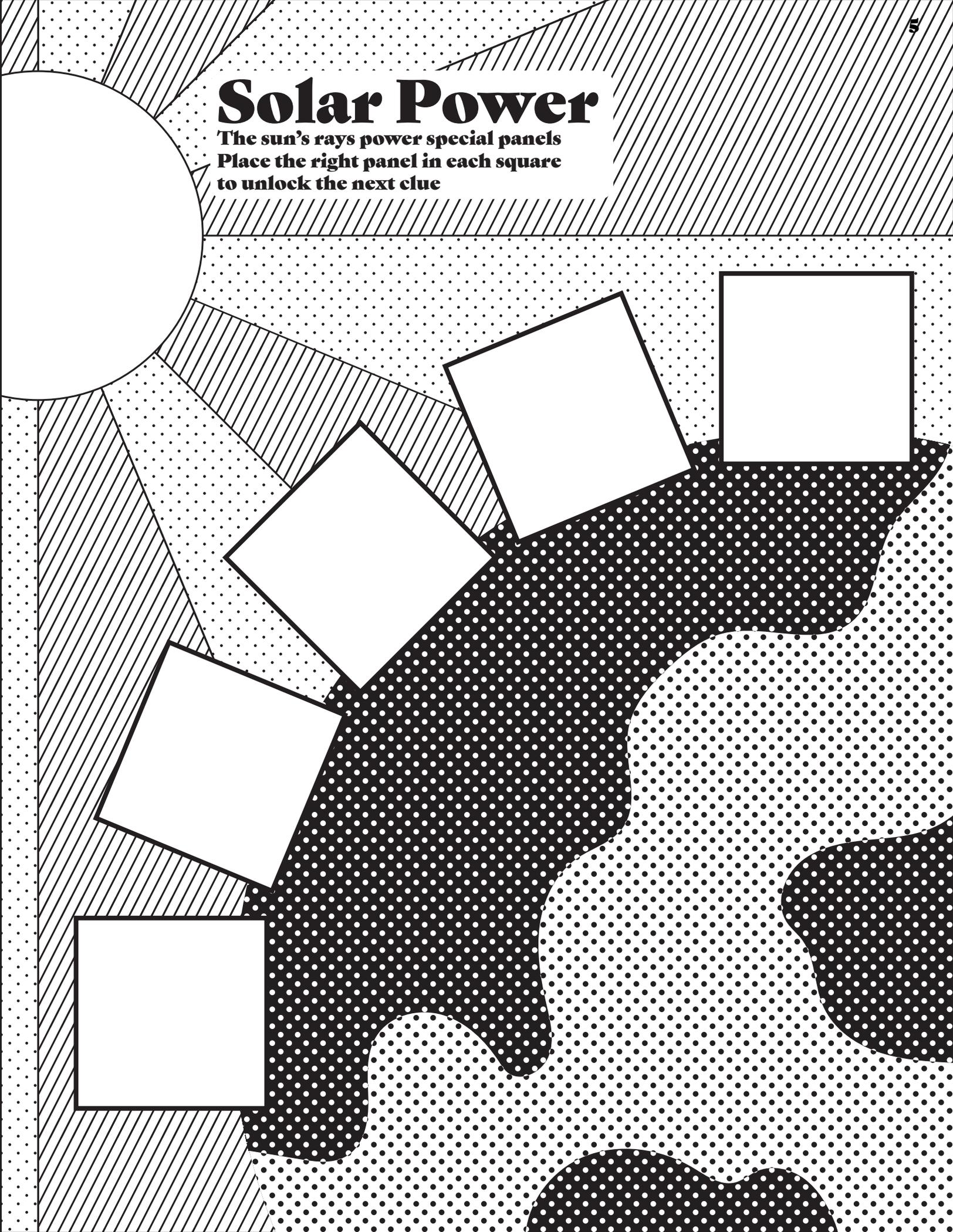


We extract energy from fossil fuels by burning the fuels to power machines.

Burning fossil fuels works at 20% - 40% efficiency, and releases Carbon Dioxide into the environment.

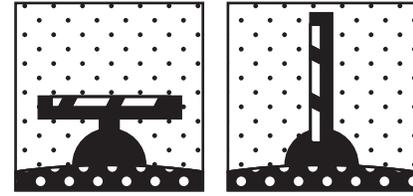
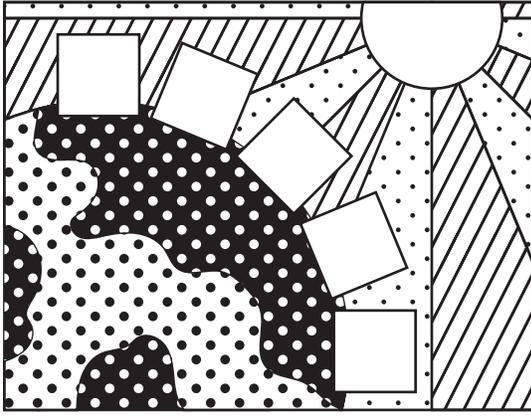
Solar Power

The sun's rays power special panels
Place the right panel in each square
to unlock the next clue

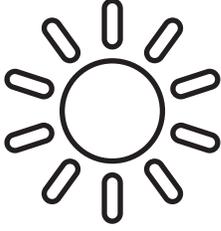


Solar Power

Lab Sheet 2

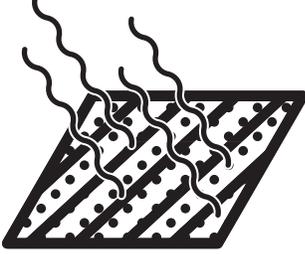


Place the solar panels on the globe to properly face the sun's beams to unlock the codeword.



Nuclear fusion in the core of the sun combines Hydrogen atoms into Helium atoms and releases huge amounts of energy.

The sun emits more energy in an hour than the entire planet uses in a year.



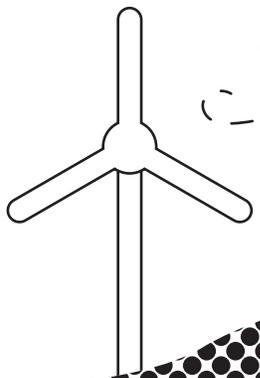
Photovoltaic Cells (solar panels) absorb the sun's energy and convert it into storable power.

Solar power is a renewable energy, solar panels can continuously generate electricity as long as the sun is shining.



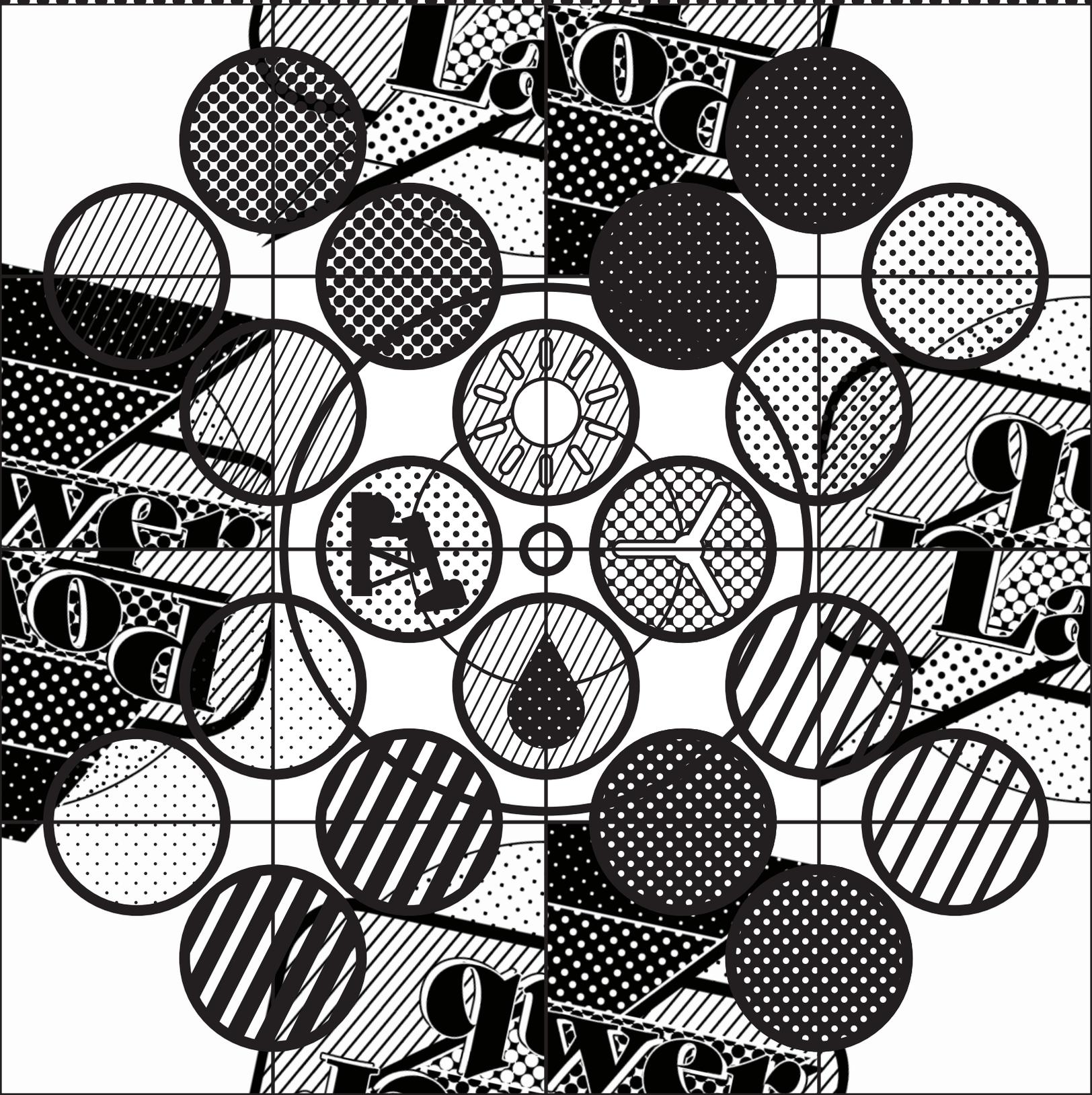
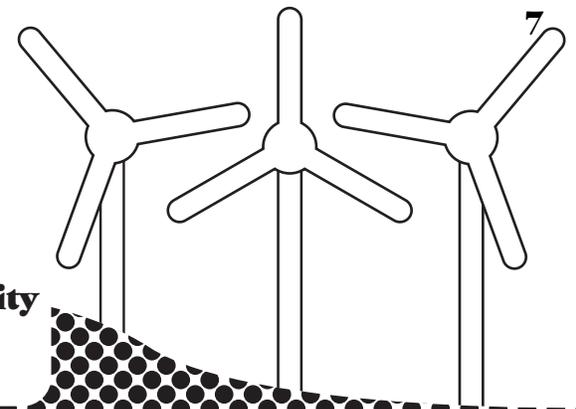
Solar Panels are often placed on rooftops or in fields to face the sun and get the most energy.

Solar panels work at between 20% - 40% efficiency, and 2% of the world's electricity comes from solar power.



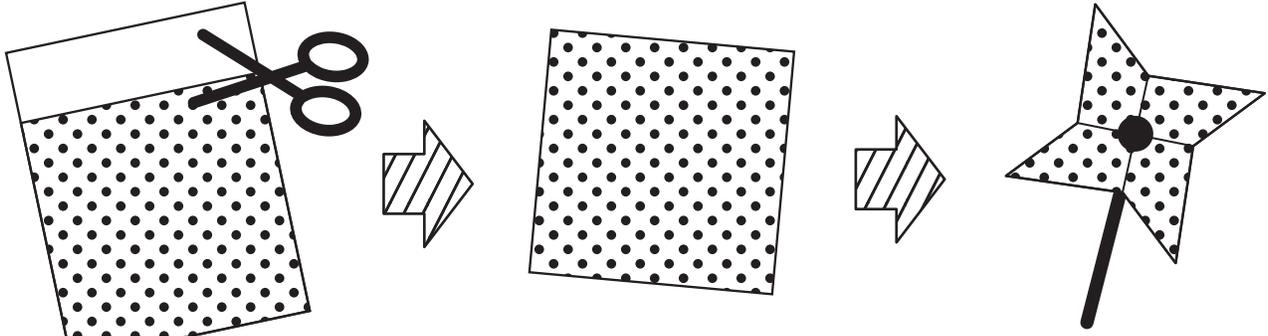
Wind Power

The wind spins turbines that create electricity
Make your own turbine out of this paper
to reveal the hidden image.



Wind Power

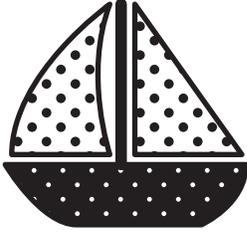
Lab Sheet 3



Cut off the header and follow the instructions to fold the paper into a wind turbine. Show the finished turbine to your Lab Assistant for the next clue!

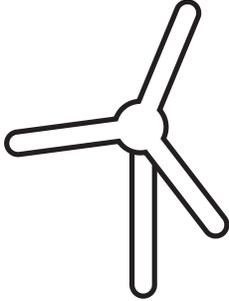


Wind power comes indirectly from the sun. As different parts of the earth warm and cool, differences in air pressure cause air to move, creating wind.



Wind can be harnessed into power using a variety of machines, including the sails that propel a sailboat.

Wind is a renewable energy, but not everywhere is windy all the time.

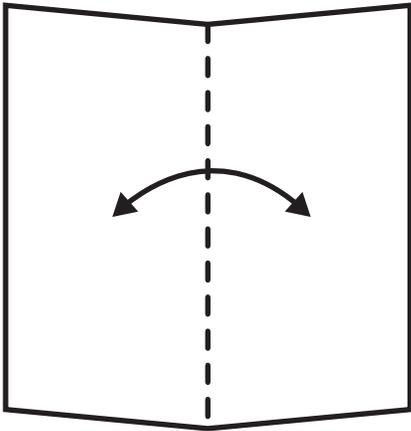
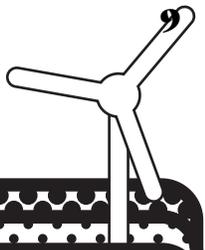


Wind farms are clusters of wind turbines that harvest electricity using electromagnetic generators.

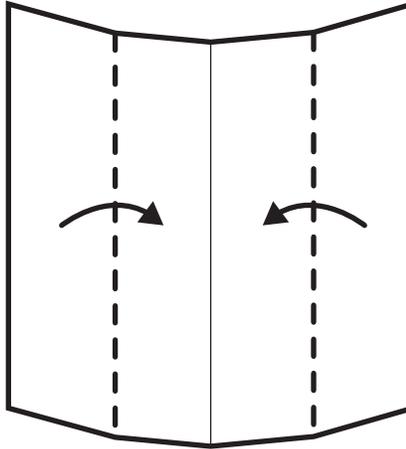
Turbines vary in shape and size, on average they need a wind speed of 14 mph to generate electricity, with 30% - 45% efficiency.

Make Your Own Turbine

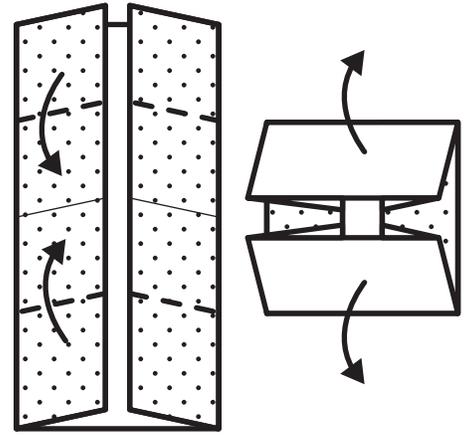
A step by step guide!



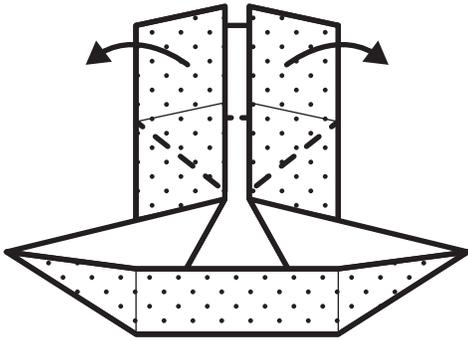
Start with the printed side face down, crease the center of the paper



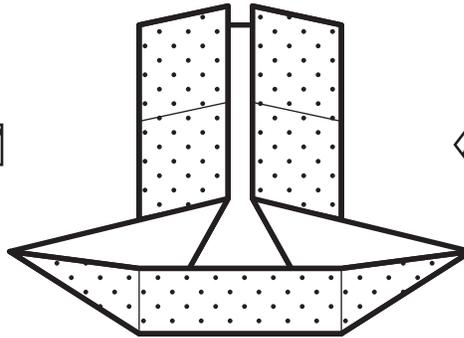
Fold the edges in to the center



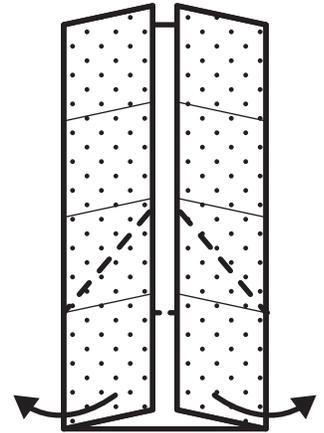
Fold the top and bottom half in, and then unfold



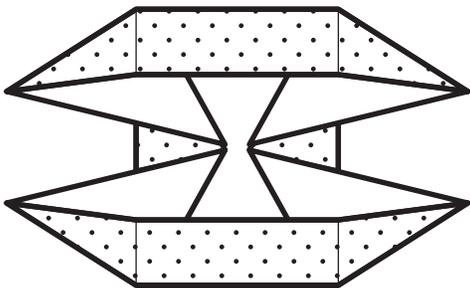
Repeat the same fold on the top half



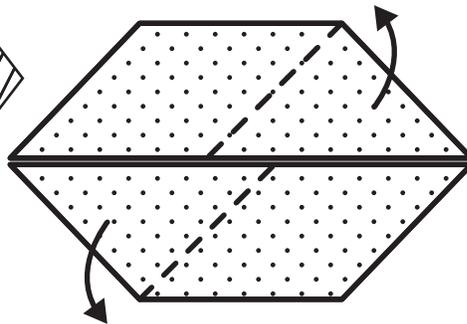
This is how it will look folded out



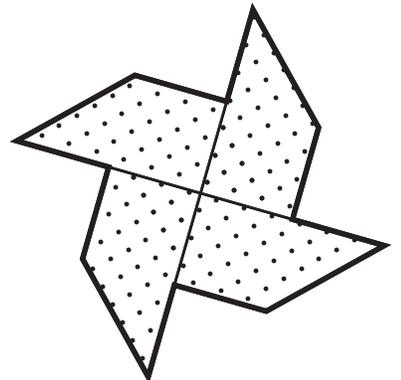
Crease on the diagonal dotted lines and fold out



This is how it should look now



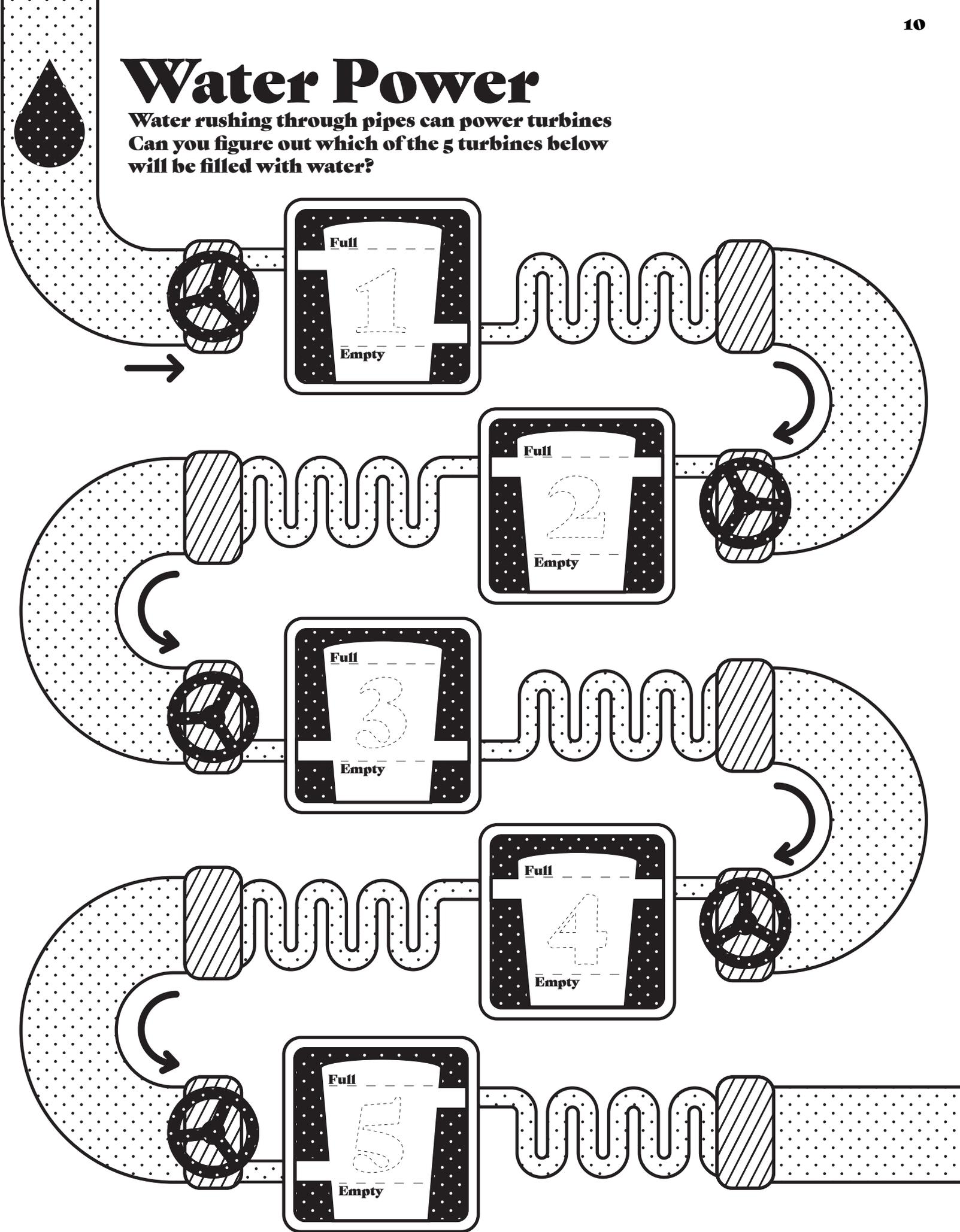
Crease on the diagonals and fold the flaps out



Celebrate your completed turbine!

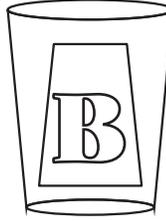
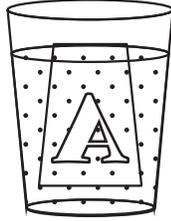
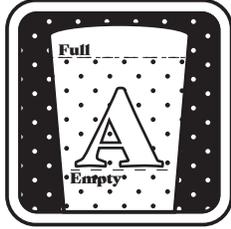
Water Power

Water rushing through pipes can power turbines
Can you figure out which of the 5 turbines below
will be filled with water?

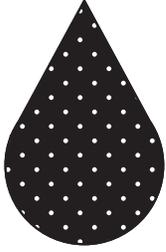


Water Power

Lab Sheet 4



If a turbine in the drawing would be filled with water, then fill the matching cup with water. Once the right cups are filled, the codeword will be revealed.



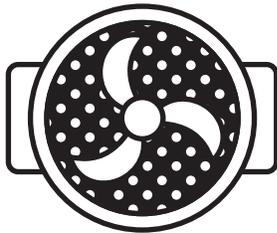
Water flows all around the planet because of either gravity or wind in rivers, streams, oceans, and lakes.

We can convert the kinetic energy of the waves and currents into electricity using different tools.



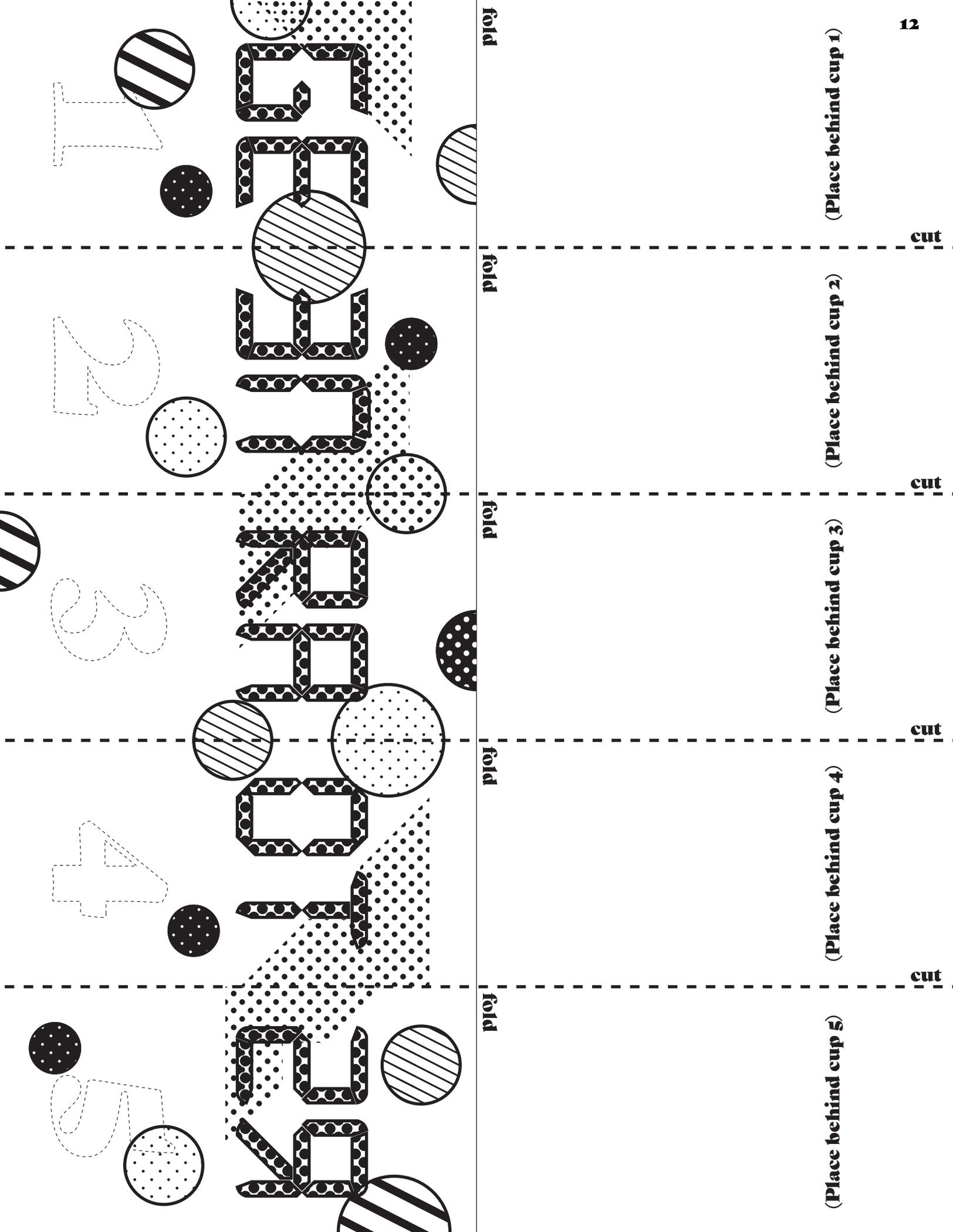
Water wheels were the first water powered generators, converting the flowing of a river into a steady rotation.

Water is a renewable energy source, as long as water is moving we can convert its motion into electricity.

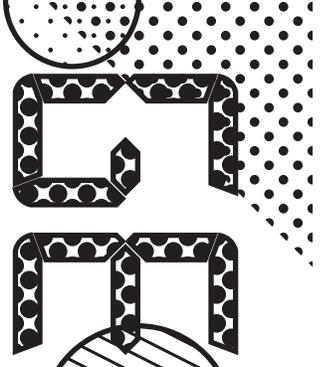


Today we build large dams to block rivers and direct their flow through water turbines.

These are called Hydroelectric Generators and work at up to 90% efficiency!

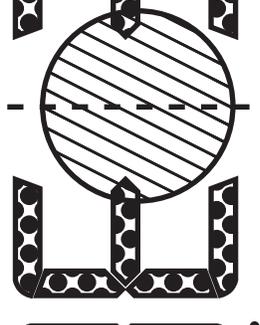
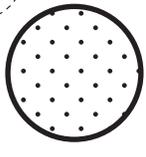


1



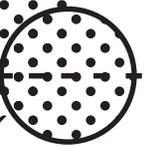
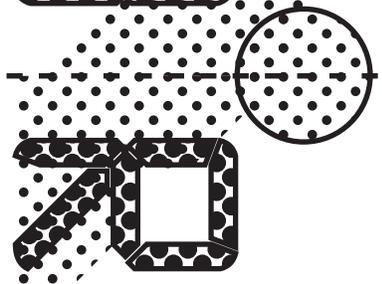
fold

2



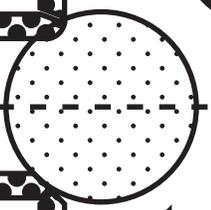
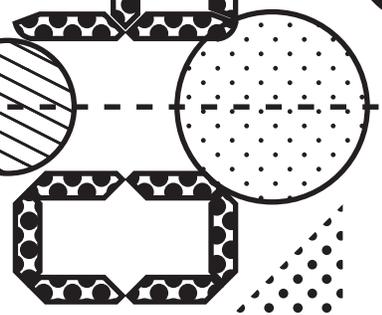
fold

3



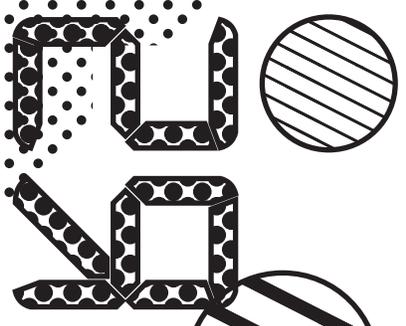
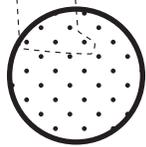
fold

4



fold

5



fold

(Place behind cup 1)

cut

(Place behind cup 2)

cut

(Place behind cup 3)

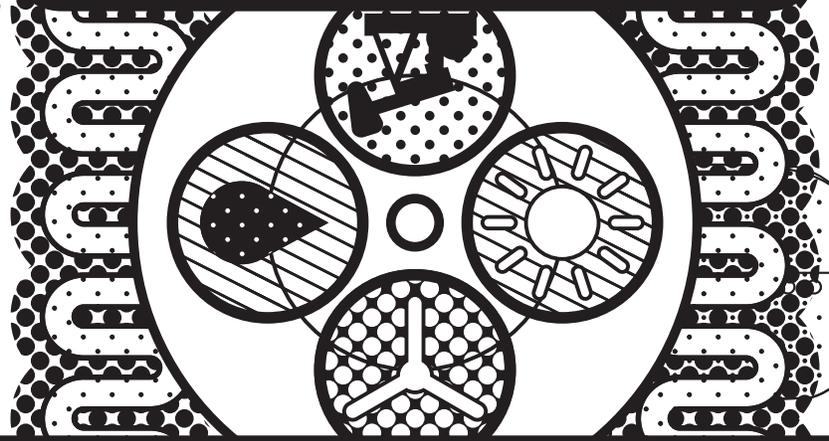
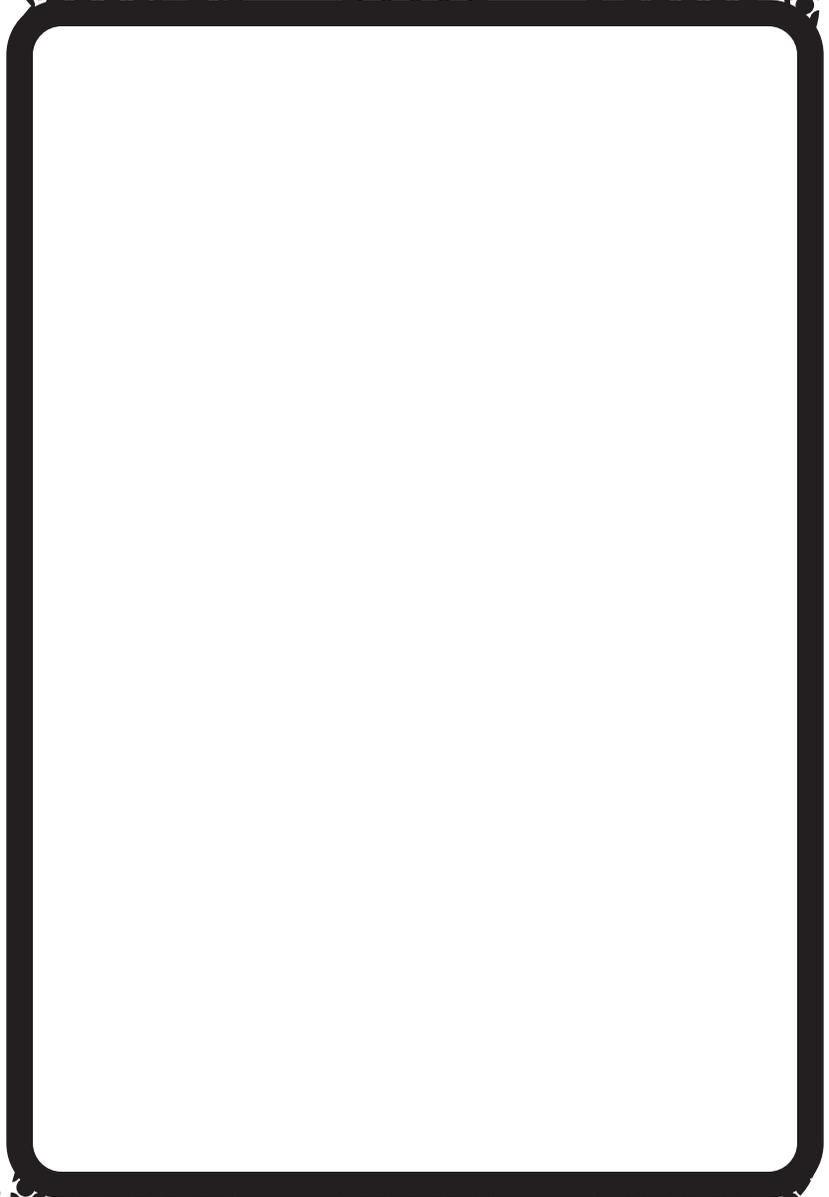
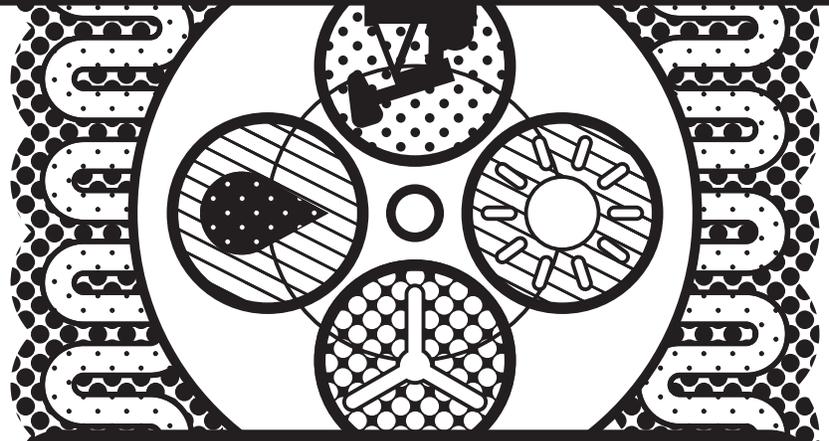
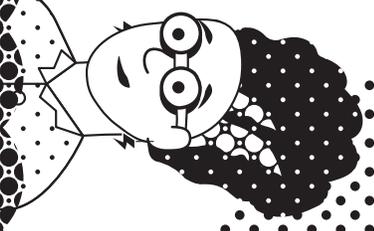
cut

(Place behind cup 4)

cut

(Place behind cup 5)

Two Bit Circus Foundation Power Lab congratulates



Your
name
here →

→ Your
picture
here

On being a Power Lab Pro!

Clue 1

**Where do you go to count some sheep,
when it's time to rest your head?
Don't give up and go to sleep...
look under me instead!**

Clue 2

**Seize the day you've found,
Here's your opportunity!
I'm the biggest pane around
Come look at your community.**

Clue 3

**Hip hip hooray! Hurrah! Chef's kiss!
I think you're great, you rule!
Though I'm your biggest kind of this,
I still keep the room cool.**

Clue 3

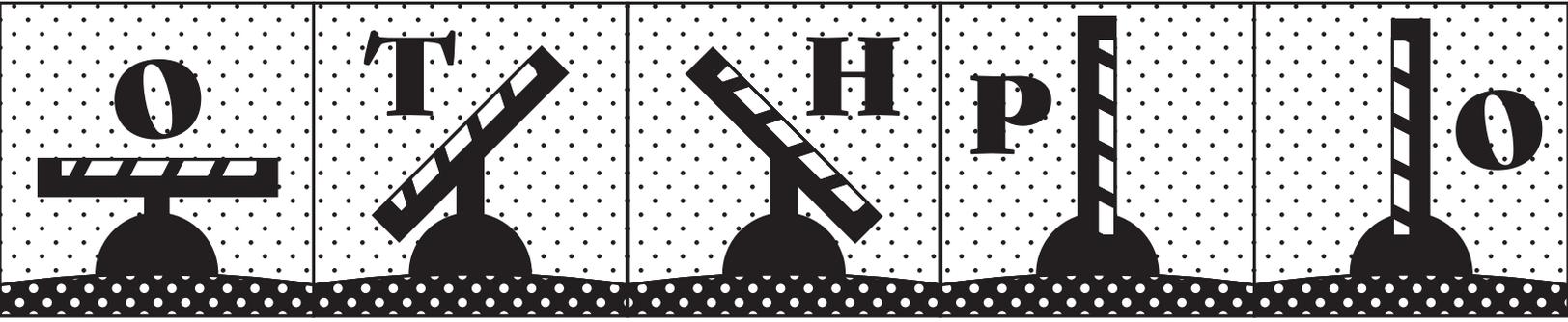
**First thing you see coming home,
Last thing you see going out,
No need to open or roam,
For a puzzle is somewhere about.**

Clue 4

**When you wish to get a drink,
popping bubbles in a blink,
all the dishes start to stink,
the next puzzle's at the _____**

Cut out these 5 tiles:

(You can discard this header)



And some spare clues, in case you want to write your own:

(You can discard this header too)

Clue

Clue

Clue