

LAB ASSISTANT MANUAL

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INTRODUCTION

Dear Parent, Guardian, or Friend,

Thank you very much for downloading Power Lab, a Print and Play Puzzle Experience. With just 10 minutes of setup on your part, your young scientist will be able to have an engaging and entertaining escape room experience full of puzzles, exploration, and activities from the comfort of your home.

This manual is a “behind the scenes” document for your eyes only full of instructions, solutions, and special tips so you can set up the Power Lab Activity Packet for your young scientist to experience.

YOUR ROLE

You will be playing the part of the Lab Assistant at Dr. Amelia Fritz’s Science Lab. As Lab Assistant, you will be setting up the activities for your scientist to complete, hand out clues during the activity, and give hints or answer any questions if needed.

MATERIALS

- Power Lab Activity Packet, printed out
- A pair of scissors
- Markers, crayons, or colored pencils
- 5 glass cups
- Paper clips (optional)
- Tape (optional)



SETUP

You will be setting up four activities around your home in the following locations:

1. Under a bed
2. Near a window
3. Near a fan OR by the front door
4. Near a sink

These locations are purposefully open ended so you can set up the activities in a way that best fits your home. Your scientist will receive clues that will lead them to each of these locations where they will complete each activity. If you are unable to set up any of the activities in any of the set locations we have provided blank clue sheets where you can write your own clues leading to locations of your choice.

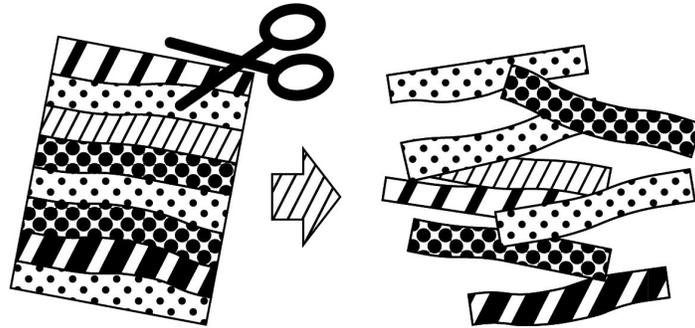
All pre-written clues can be found on page 14 of the Power Lab Activity Packet. Please cut these out along the dotted line. If you would like to write some of your own clues instead, blank clues can be found on page 15 of the Power Lab Activity Packet. If you would like to do more than 3 custom clues, you might need to print page 15 twice.

LAB INTRO

Take page 2 of the Power Lab Activity Packet and Clue 1 and set them aside. These will be what you hand to your scientist to begin their Power Lab experience. Clue 1 will lead your scientist to the Oil Power Activity.

OIL POWER ACTIVITY

To set up this activity, take Page 3 (Oil Power Activity) of the Power Lab Activity Packet, cut out the 8 strips along the dotted line, and scramble their order.



Hide the 8 strips along with Page 4 of the Power Lab Activity Packet (Oil Power Lab Sheet) under a bed somewhere in the house.

The Oil Lab is hidden under a bed to imitate how we find oil and other fossil fuels buried deep underground. Here the layers of bed represent the layers of earth. If it is not possible to place the Oil Lab underneath the bed, then it can be placed under a pillow or bedspread on the bed. The clue should still lead your scientist there. Feel free to play “hotter or colder” if your scientist is close but still having trouble finding the activity.

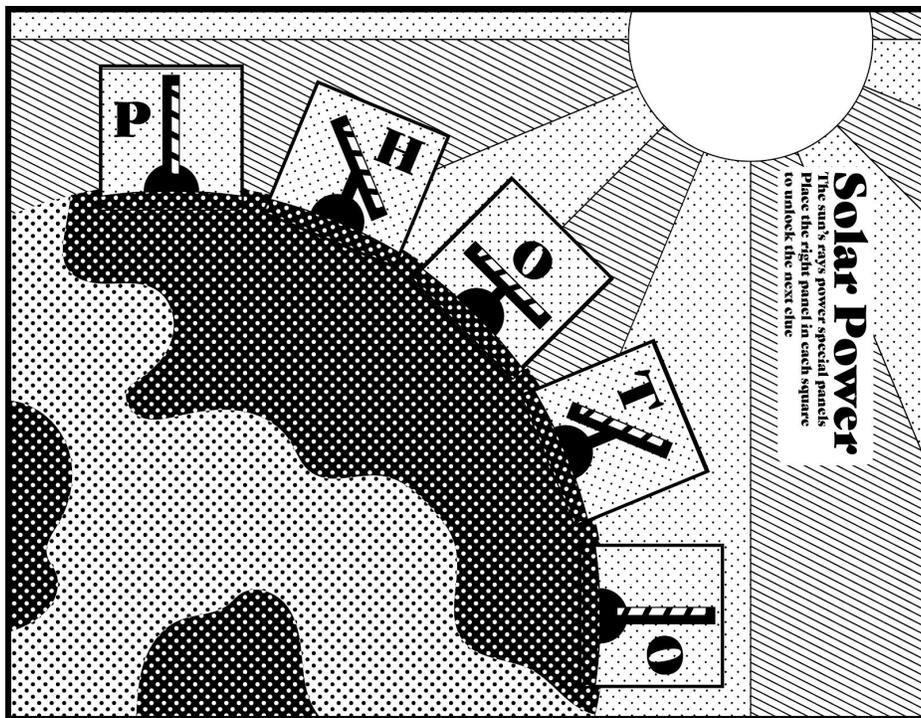
To solve the activity, your scientist has to stack the strips like they’re solving a puzzle and spell the codeword “BURNING”. Once they have solved the puzzle and tell you the codeword, hand them Clue 2. This will lead them to the Solar Power Activity.

SOLAR POWER ACTIVITY

To set up this activity, cut out the 5 solar panel tiles on Page 15 of the Power Lab Activity Packet and hide them with Page 5 (Solar Power Activity) and 6 (Solar Power Lab Sheet) of the Power Lab Activity Packet somewhere near a window.

The Solar Lab is hidden near a window because that is the most direct source of solar energy in most homes. Once again, feel free to play “hotter or colder” (or even “sunny or cloudy”) if your scientist is close but still having trouble finding the activity.

To solve this activity, your scientist needs to orient the 5 solar panel tiles in the 5 square spaces so the solar panels are all facing the sun. Solar panels are oriented differently all around the world to make sure they best face the sun and receive the most energy.



Once the solar panels are placed like above and spell the special codeword “PHOTO” you may give your scientist Clue 3. This will lead them to the Wind Power Activity.

You will only give them one Clue 3 that leads to where you chose to hide it.

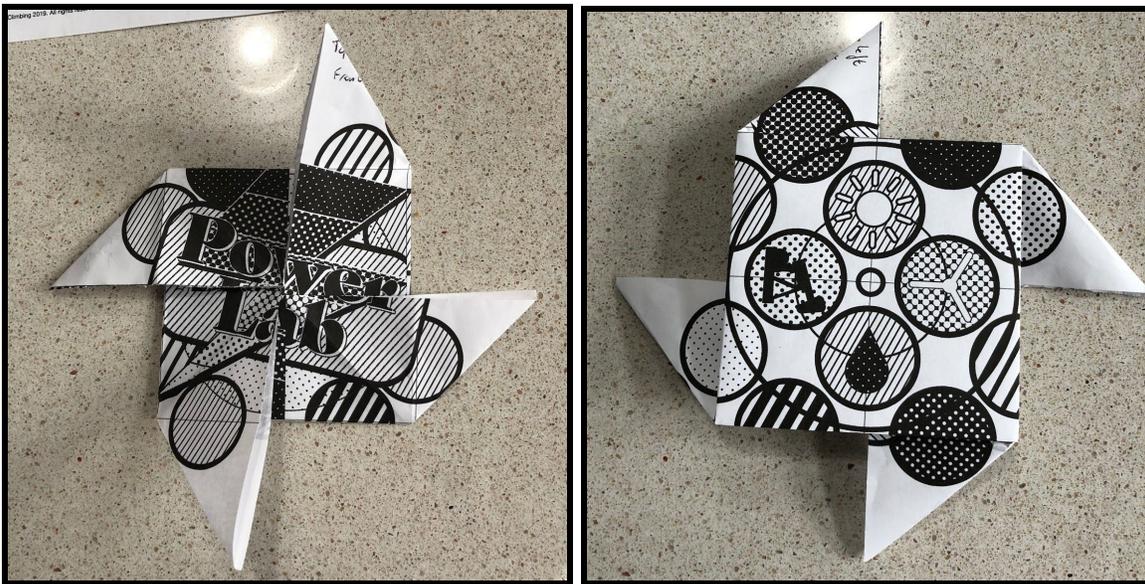
WIND POWER ACTIVITY

[Depending on your scientist's comfort level with scissors, you might want to pre-cut along the dotted line on Page 7 of the Power Lab Activity Packet (Wind Power Activity), or assist them as when they reach this stage of the experience.

Also, if your printer printed this page with margins, make sure to cut off the margins before folding. The starting piece should be a square piece of paper.]

To set up this activity, take Page 7 (Wind Power Activity), 8 (Wind Power Lab Sheet), and 9 (Turbine Folding Instructions), and hide them EITHER near a fan in your home OR near the front door of your home. No matter where you pick, make sure to discard the Clue 3 that does not apply as to not give a confusing clue.

To solve this activity, your scientist needs to follow the Turbine Folding Instructions and make their own pinwheel. Depending on your scientist's folding experience you may need to assist them. However, it's best to encourage patience and see to it that they complete the pinwheel. Once completed the pinwheel should look like this on the front and back:



If you're looking to extend the time of this activity, encourage your scientist to color in the pinwheel's design, or make their own pinwheels with their own patterns. You can also use a thumbtack to affix the paper pinwheel to a plastic straw.

Once the pinwheel is completed, give your scientist Clue 4. This will lead them to the Water Power Activity.

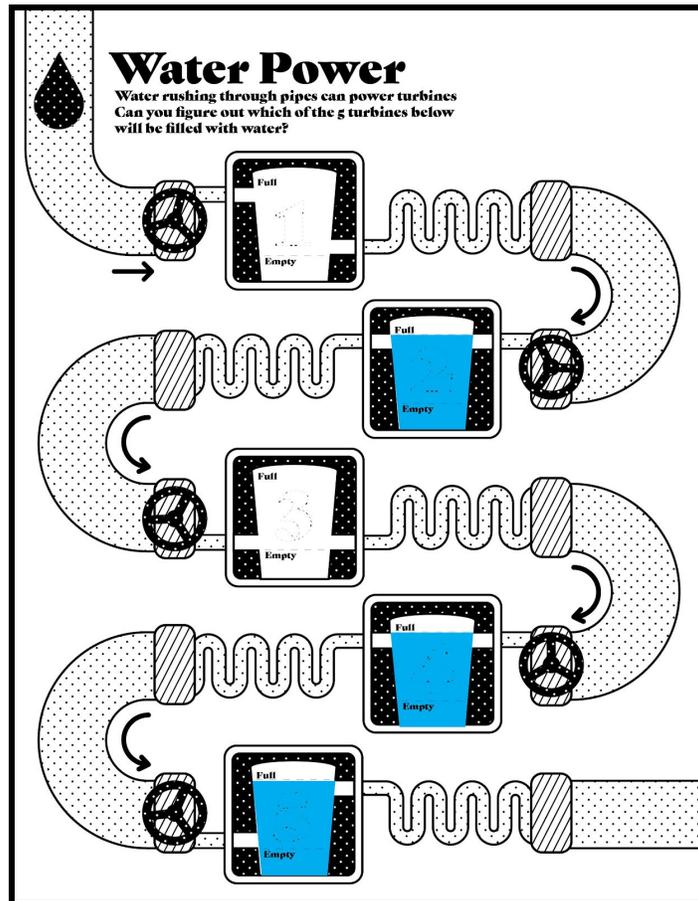
WATER POWER ACTIVITY

To set up this activity, take page 12 of the Power Lab Activity Packet and cut along the dotted lines. Fold along the crease line so each piece can stand up on its own, and place each piece behind a glass cup in a row, about 2-3 inches away from the cup. Place these cups somewhere close to a sink.

Then, take page 10 (Water Power Activity) and 11 (Water Power Lab Sheet) and place them next to the cups near the sink.

The Water Lab is placed near a sink as the sink is a consistent source of water in the house.

To solve this activity, your scientist will need to refer to the Water Power Activity and determine which of the 5 turbines in the diagram would fill with water. The water is flowing down from the top of the page in the direction of the arrows.



The solution is Turbines 2, 4, and 5, because the exit pipe is at the same level as the full line of the Turbine, meaning that if water were to run through the system those turbines would fill up with water. It may help your scientist solve the puzzle if you provide a marker or crayon that they can color in the turbines with.

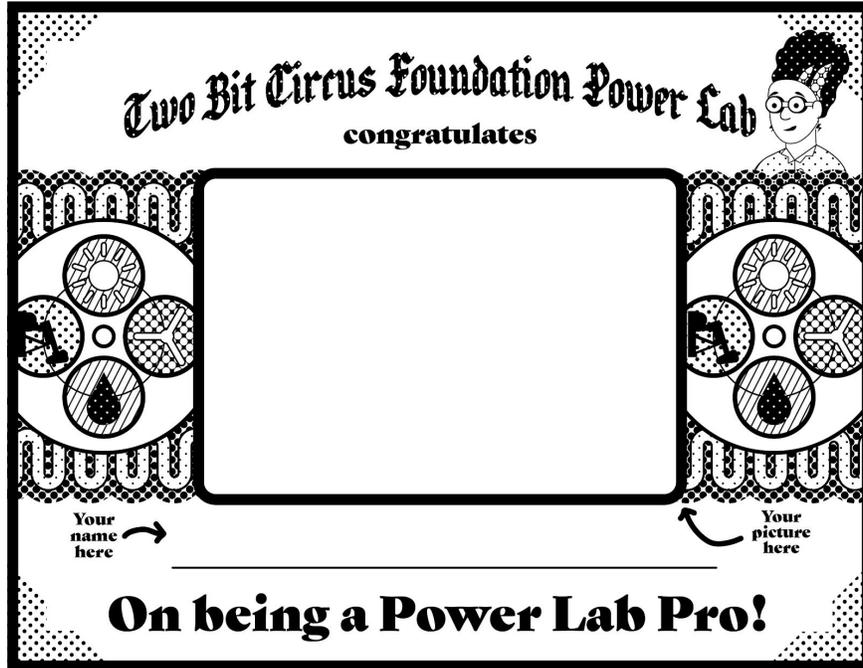
Once your scientist has concluded Turbines 2, 4, and 5 would fill with water, they will fill the corresponding cups 2, 4, and 5 with water. This will cause a cool optical trick where the cards behind the cups filled with water will have their contents reversed when looking through the glass.

If this effect does not work for you or you do not have glass cups in your home, the same effect can be achieved by holding cards 2, 4, and 5 up to a mirror.

Once cups 2, 4, and 5 are filled with water the cards should read "GENERATORS". With the code word unlocked, you can present your scientist their Certificate of Completion!

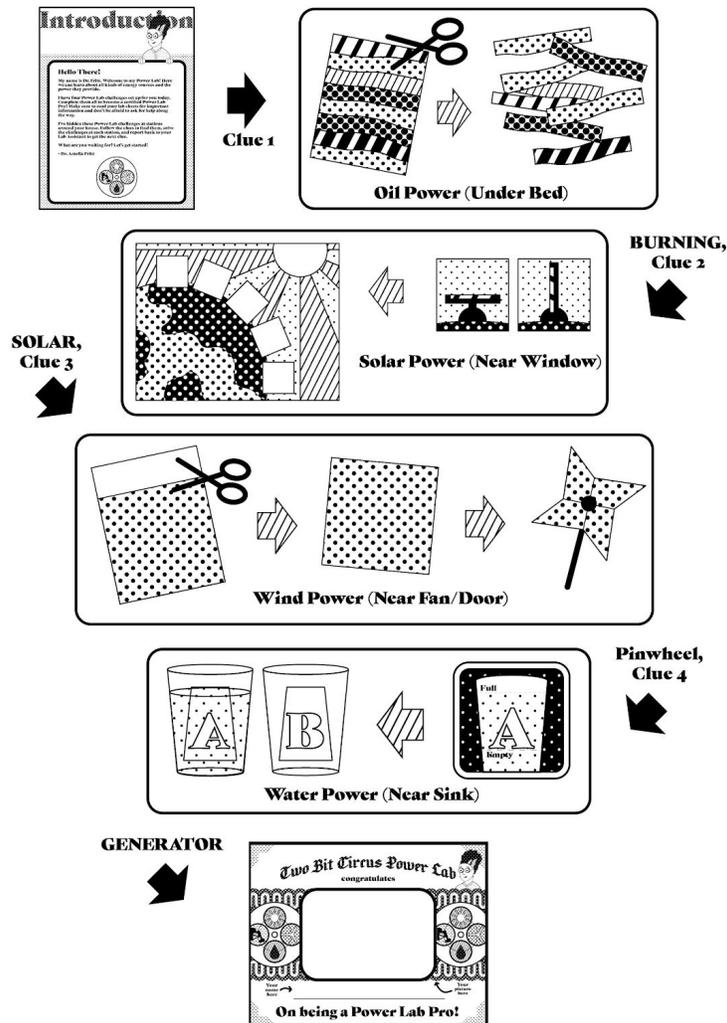
CERTIFICATE

The Certificate of Completion can be found on page 13 of the Power Lab Activity Packet. Your scientist can draw a picture of themselves in the square (or a 4 x 6 printed photo will fit in the space), and have their name written on the line. They may also color in the certificate. Now it can be hung up proudly in their room, on the refrigerator, next to the trophy shelf, or behind their desk at their Fortune 500 company. To be a Power Lab Pro is of the highest of honors.



FULL OUTLINE

Here's a quick recap of the experience from beginning to end and what to keep in mind at each step.



- Intro
 - Welcome document and Clue 1
- Oil (UNDER BED)
 - To Prepare:
 - Oil Activity Sheet (cut up), Oil Lab Sheet
 - Codeword: BURNING
 - Give Clue 2
- Solar (AT WINDOW)
 - To Prepare:
 - Solar Activity Sheet, 5 Solar Panel Tiles (cut out), Solar Lab Sheet
 - Codeword: PHOTO
 - Give Clue 3

- Wind (FAN OR FRONT DOOR)
 - To Prepare:
 - Wind Activity Sheet, Wind Lab Sheet, Turbine Folding Instructions
 - Fold the pinwheel
 - Give Clue 4
- Water (NEAR SINK)
 - To Prepare:
 - Water Activity Sheet, 5 cards (cut out), Water Lab Sheet, 5 glass cups
 - Codeword: Generators
 - Give Certificate
- CERTIFICATE

FUN TIPS

- Learning opportunities
 - Don't forget that each Lab Activity also has a Lab Sheet full of lots of interesting facts about each power source. If possible, encourage your scientist to engage with this information. Feel free to get creative and make this information relevant to them.

- Number of Players
 - Dr. Fritz says the more scientists, the merrier! Siblings are encouraged to work together to solve challenges, or consider coordinating with other Lab Assistants to set up the Power Lab experience in different homes and have your scientists play together over FaceTime or another video chat platform. If you do intend to have more than one scientist play at a time, remember to print out the right number of activity sheets and certificates.

- Extending gameplay
 - All these activity sheets may double as coloring sheets
 - Print out more clues to create a longer trail of clues leading between challenges. For example, if you wrote a custom clue that lead your scientist to their favorite snack in the cabinet, and then in the cabinet you hid one of the pre-written clues leading to the next activity, that would add another step to the experience and make the game take longer.
 - Also get creative with how you hide the activities. Are they in plain sight, or hidden away? Use tape, string, pins, paper clips, or anything else on hand to provide a more crafty challenge for your scientist.