Easter & Spring STEM

pollen collector challenge

CREATED BY BROOKE BROWN

contents

©BROOKE BROWN

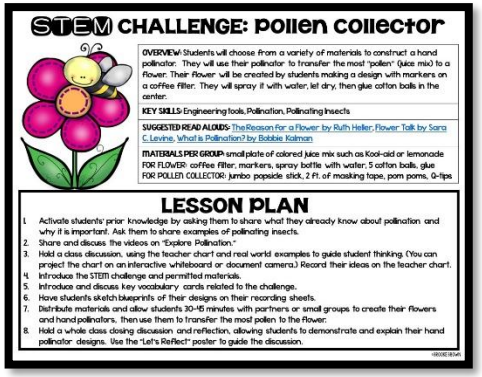
How to use

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

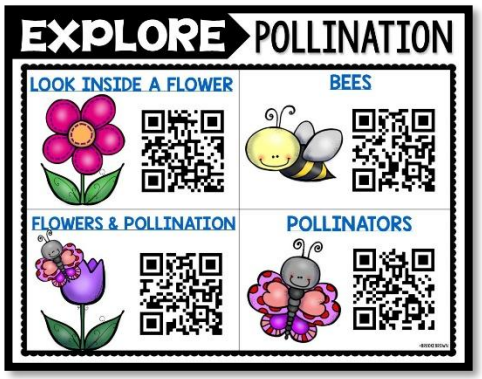
LESSON PLAN

- Overview
- Skills
- Read Aloud Ideas
- Supplies

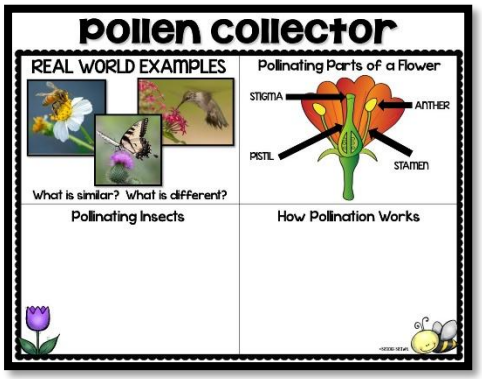


STUDENT INSTRUCTIONS

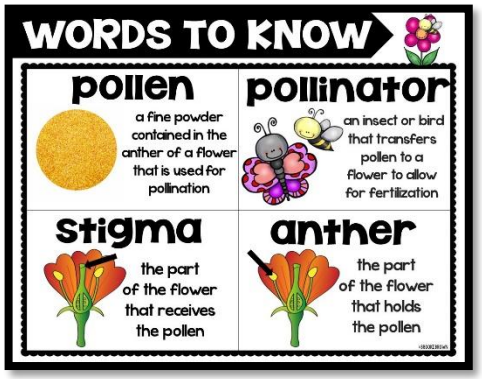
QR CODE WEBSITES & VIDEOS



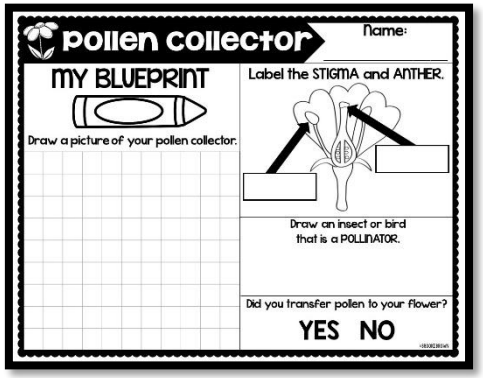
TEACHER ANCHOR CHART



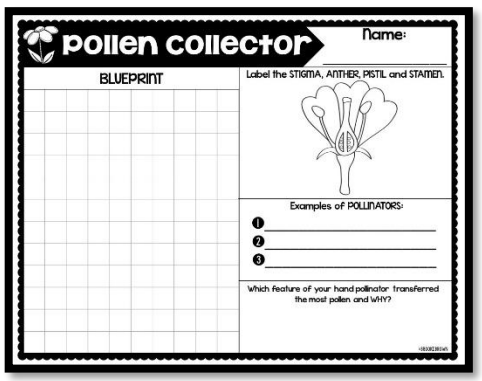
KEY VOCABULARY



K-2nd RECORDING SHEET



3rd-5th RECORDING SHEET



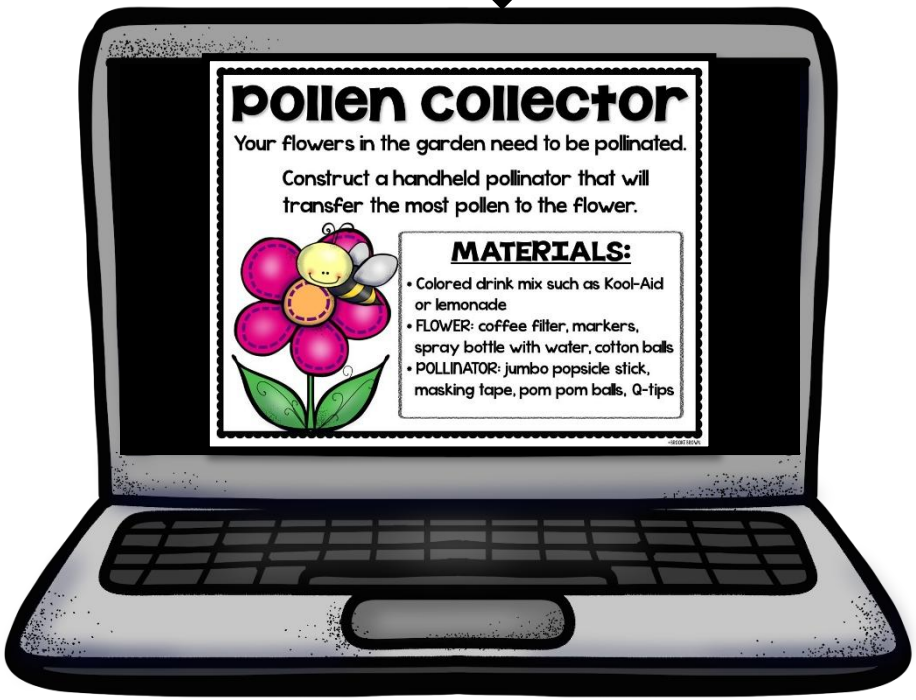
REFLECTION DISCUSSION QUESTIONS

©BROOKE BROWN

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.

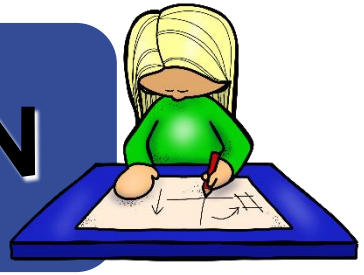
©BROOKE BROWN

THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



CREATE

TEST & IMPROVE

REFLECT & PRESENT

©BROOKE BROWN

SUPPLIES CHECKLIST

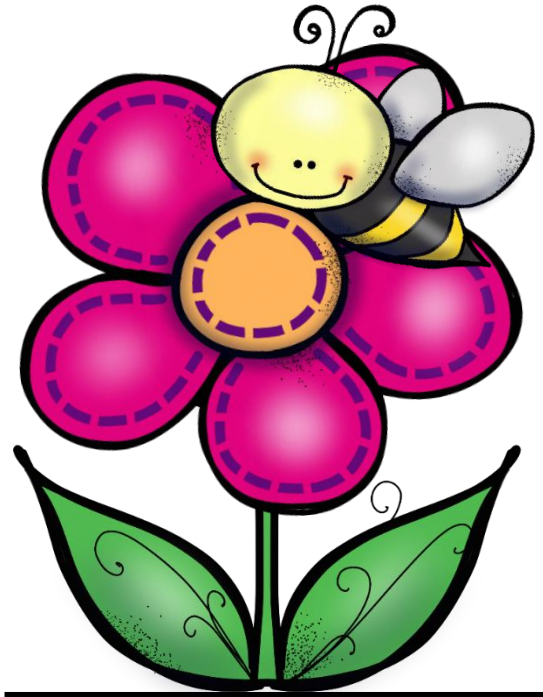
STEM CHALLENGE	ITEM	NUMBER PER GROUP	I HAVE IT
Pollen Collector	jumbo popsicle sticks	1	
	masking tape	2 feet	
	coffee filter and markers	1	
	cotton balls	5	
	spray bottle with water	1 per class	
	Kool-Aid or drink mix in a variety of colors	1 small plate	
	OPTIONS FOR POLLEN STICK CONSTRUCTION: pom pom balls, Q-tips	small tubs for class to share	

STANDARDS ALIGNMENT

CHALLENGE	ENGINEERING	SCIENCE	MATH
Pollen Collector	K-2-ETSI Engineering Design: K-2-ETSI-1, 3-5 ETSI-2, 3-5 ETSI-3 3-5-ETSI Engineering Design: 3-5-ETSI-1, 3-5 ETSI-2, 3-5 ETSI-3	2.Interdependent Relationships in Ecosystems 5-LS2 Ecosystems: Interactions, Energy, and Dynamics	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

©BROOKE BROWN

STEM CHALLENGE: Pollen Collector



OVERVIEW: Students will choose from a variety of materials to construct a hand pollinator. They will use their pollinator to transfer the most "pollen" (juice mix) to a flower. Their flower will be created by students making a design with markers on a coffee filter. They will spray it with water, let dry, then glue cotton balls in the center.

KEY SKILLS: Engineering tools, Pollination, Pollinating Insects

SUGGESTED READ ALOUDS: The Reason for a Flower by Ruth Heller, Flower Talk by Sara C. Levine, What is Pollination? by Bobbie Kalman

MATERIALS PER GROUP: small plate of colored juice mix such as Kool-aid or lemonade
FOR FLOWER: coffee filter, markers, spray bottle with water, 5 cotton balls, glue
FOR POLLEN COLLECTOR: jumbo popsicle stick, 2 ft. of masking tape, pom poms, Q-tips

LESSON PLAN

1. Activate students' prior knowledge by asking them to share what they already know about pollination and why it is important. Ask them to share examples of pollinating insects.
2. Share and discuss the videos on "Explore Pollination."
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. Have students sketch blueprints of their designs on their recording sheets.
7. Distribute materials and allow students 30-45 minutes with partners or small groups to create their flowers and hand pollinators, then use them to transfer the most pollen to the flower.
8. Hold a whole class closing discussion and reflection, allowing students to demonstrate and explain their hand pollinator designs. Use the "Let's Reflect" poster to guide the discussion.

©BROOKE BROWN

pollen collector

POSSIBLE PRODUCT

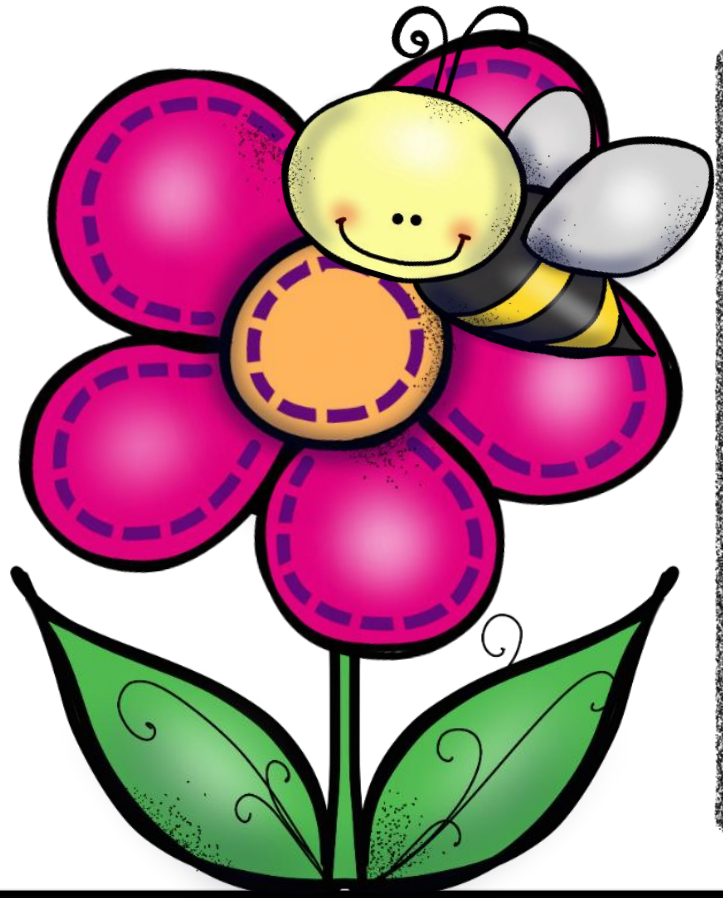
(for teacher reference only)

©BROOKE BROWN

Pollen Collector

Your flowers in the garden need to be pollinated.

Construct a handheld pollinator that will transfer the most pollen to the flower.



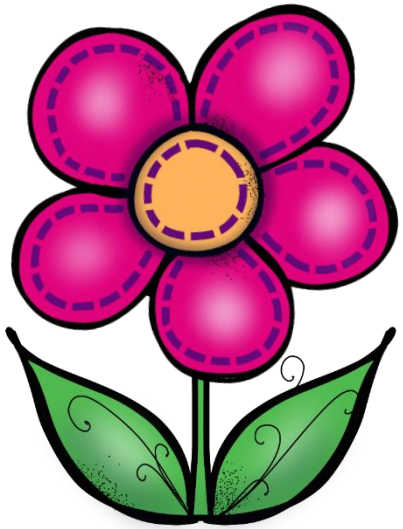
MATERIALS:

* Colored drink mix such as Kool-Aid or lemonade
* FLOWER: coffee filter, markers, spray bottle with water, cotton balls
* POLLINATOR: jumbo popsicle stick, masking tape, pom pom balls, Q-tips

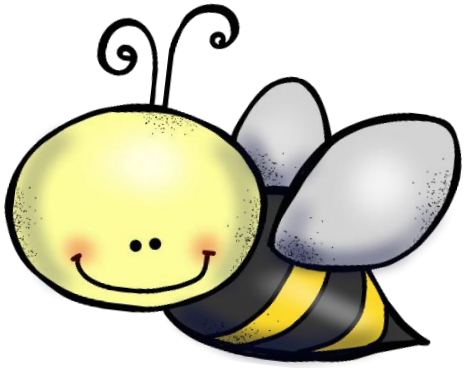
©BROOKE BROWN

EXPLORE POLLINATION

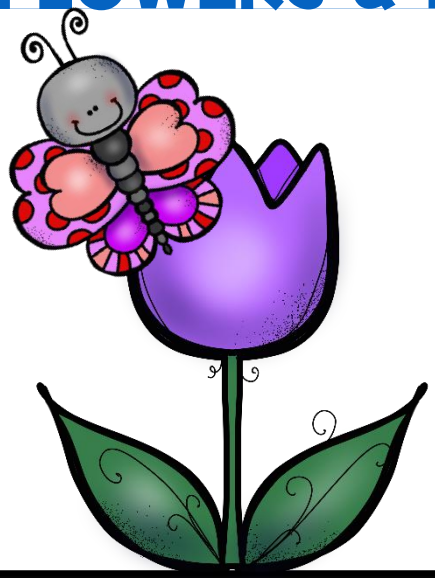
LOOK INSIDE A FLOWER



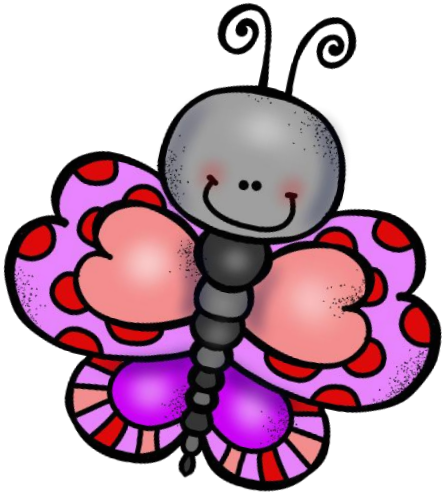
BEES



FLOWERS & POLLINATION



POLLINATORS



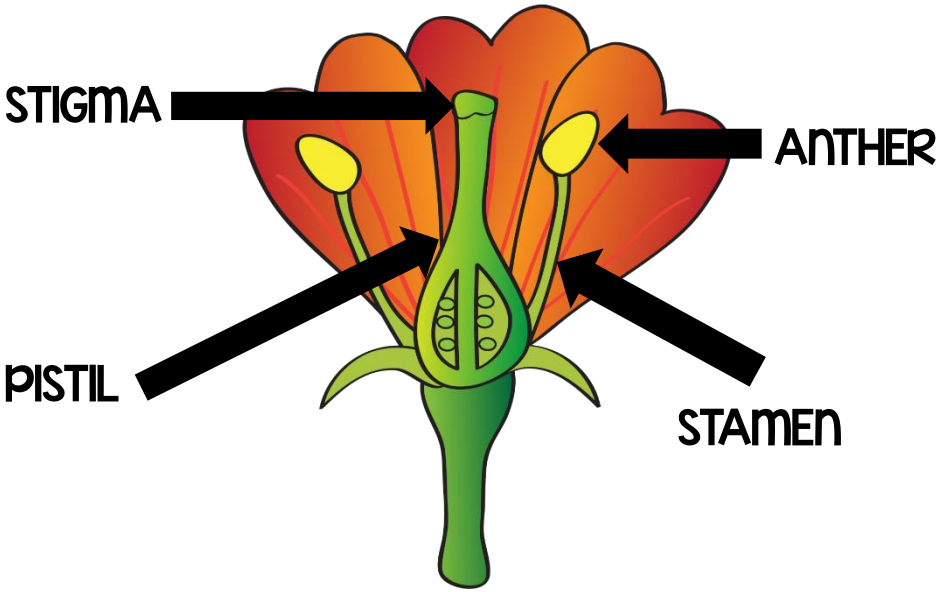
©BROOKE BROWN

Pollen Collector

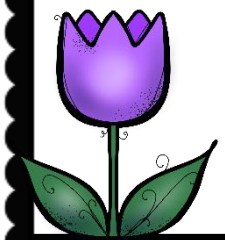
REAL WORLD EXAMPLES

What is similar? What is different?

Pollinating Parts of a Flower



Pollinating Insects



How Pollination Works

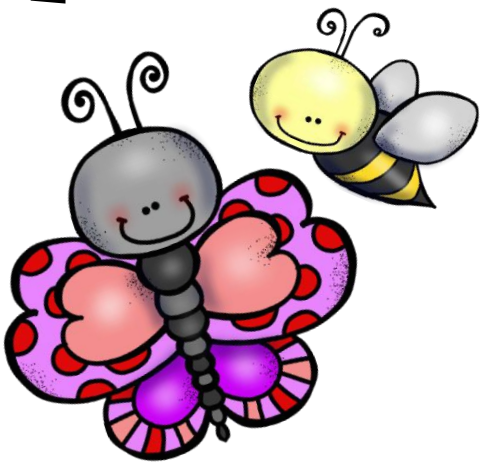
©BROOKE BROWN

WORDS TO KNOW

pollen

a fine powder contained in the anther of a flower that is used for pollination

pollinator

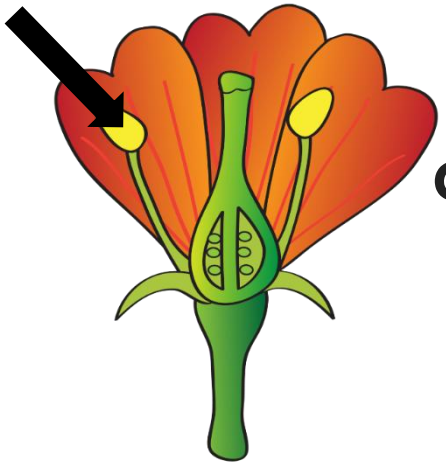


an insect or bird that transfers pollen to a flower to allow for fertilization

stigma

the part of the flower that receives the pollen

anther



the part of the flower that holds the pollen

©BROOKE BROWN

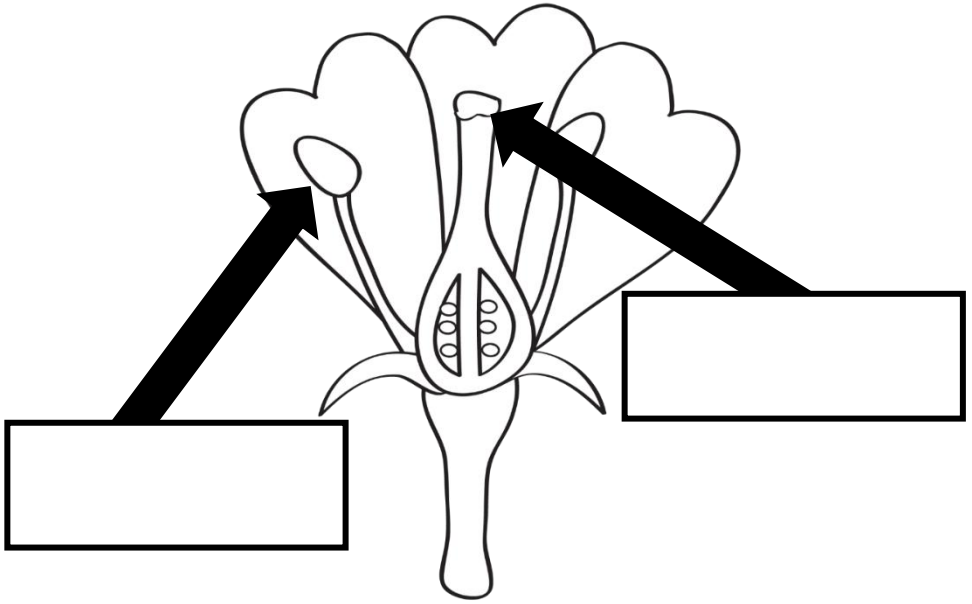
pollen collector

Name: _____

MY BLUEPRINT

Draw a picture of your pollen collector.

Label the STIGMA and ANTHER.



Draw an insect or bird
that is a POLLINATOR.

Did you transfer pollen to your flower?

YES NO

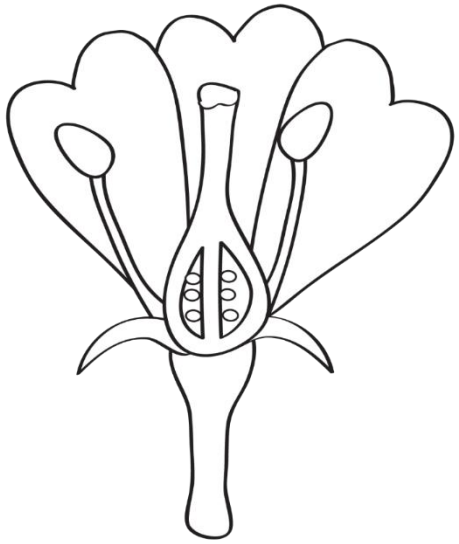
©BROOKE BROWN

pollen collector

Name: _____

BLUEPRINT

Label the STIGMA, ANTHER, PISTIL and STAMEN.



Examples of POLLINATORS:

1. _____
2. _____
3. _____

Which feature of your hand pollinator transferred the most pollen and WHY?

©BROOKE BROWN

LET'S REFLECT!

- What was most difficult about this challenge?
- What does pollination mean and why is it important?
- What are some examples of living things that are pollinators?
- What might happen if those living things did not pollinate?
- How is your hand pollinator similar to and different from real pollinators?
- What do you think it means to cross-pollinate?
- If we completed this challenge again, what would you do differently next time?

©BROOKE BROWN

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: _____

©BROOKE BROWN

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: _____

©BROOKE BROWN

STEAM 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: _____

©BROOKE BROWN

STEAM Challenge Assessment Rubric

Challenge: _____

Date: _____

Student Name: _____

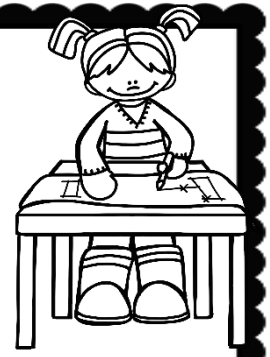
3	2	1
Student followed all instructions for challenge.	Student followed some instructions for challenge.	Student did not follow instructions for challenge.
Student used best effort and perseverance on challenge.	Student used some effort and perseverance on challenge.	Student did not show effort or perseverance 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: _____

©BROOKE BROWN

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:

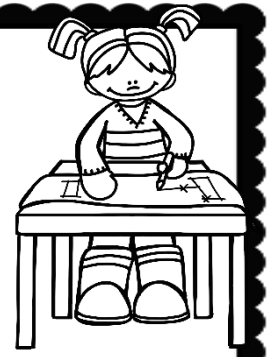
Parent Name(s): _____

Child's Name: _____

I am able to donate: _____

©BROOKE BROWN

We Need STEAM Supplies!



Dear Families,

We are learning all about Science, Techology, Engineering, Art, and Math through STEAM lessons, and we need your help! If you are able to donate any of the following supplies for our STEAM 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 STEAM 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: _____

©BROOKE BROWN

Credits

Created by Brooke Brown

Thank you for your purchase!

The Painted Crow
Illustrations for Education

kimberly geswein fonts kg

WHIMSY CLIPS

EDUCLIPS DESIGN
Dream it. Wish it. Do it.

UtahRoots

i teach.
WHAT'S YOUR SUPER POWER?

Ashley Hughes

ZIP-A-DEE DOO-DAH Designs
teacherspayteachers.com/Store/Zip-a-dee-doo-dah-Designs

http://www.teacherspayteachers.com/Store/Zip-a-dee-doo-dah-Designs

Confetti GRAPHICS

©BROOKE BROWN