Boyles Science Packet 17-21

"Summer STEM Box Challenges"

Day 17: Read **Engineering Process Page** and put together a **"Summer STEM Box."** Complete **"Planning sheet."** Take pictures of the **Summer STEM Box** and **Planning Sheet** and send attachments on Livegrades message.

Day 18: Complete a **"STEM Challenge Card"** and take pictures of your challenge and send attachment on Livegrades message.

Day 19: Complete a **"STEM Challenge Card"** and take pictures of your challenge and send attachment on Livegrades message.

Day 20: Complete a **"STEM Challenge Card"** and take pictures of your challenge and send attachment on Livegrades message.

Day 21: Complete a **"STEM Challenge Card"** and pick **one** of your challenges to complete the **"Reflection Sheet."** Take pictures of your challenge and Reflection Sheet and send attachment on Livegrades message.

Thank you!

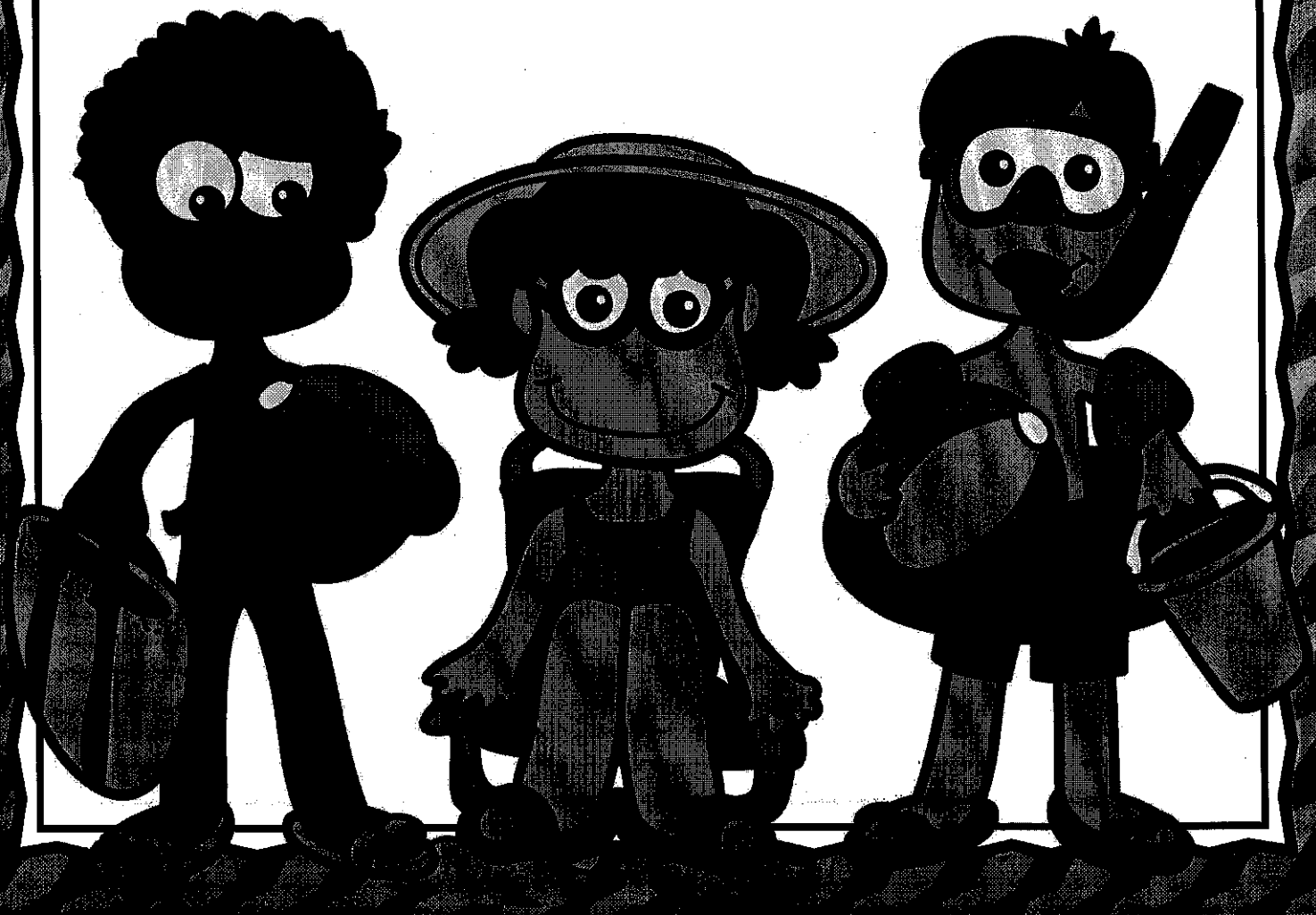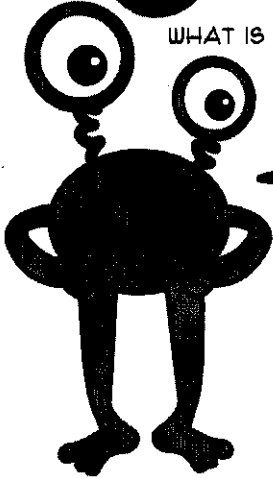# TABLE OF CONTENTS
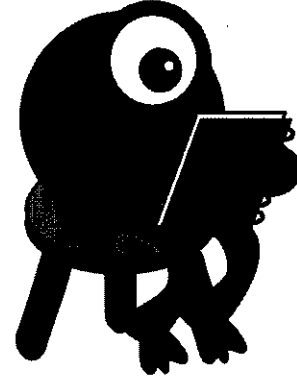
STEM ENGINEERING PROCESS

① ASK
WHAT IS THE PROBLEM I NEED TO SOLVE??

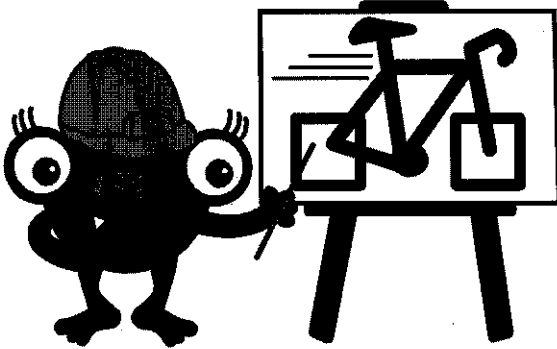*My friends and I need to design a fast bike to ride to school!*

② IMAGINE
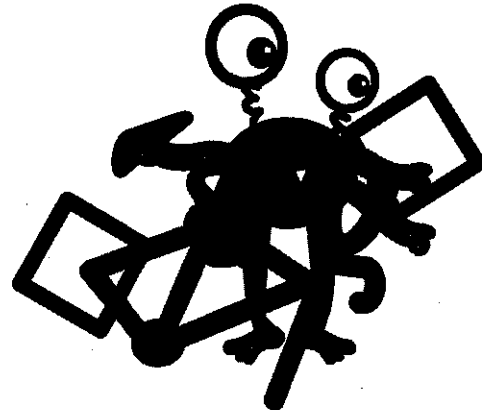WHAT ARE SOME WAYS TO SOLVE THIS PROBLEM?

③ PLAN
WHAT ARE WE GOING TO DO TO SOLVE THE PROBLEM?
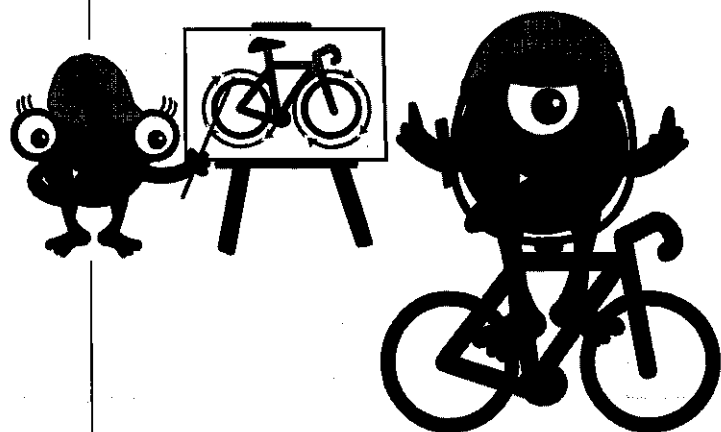
④ CREATE
LET'S BUILD IT!!!

⑤ TEST
HOW WELL DOES IT WORK?

⑥ IMPROVE
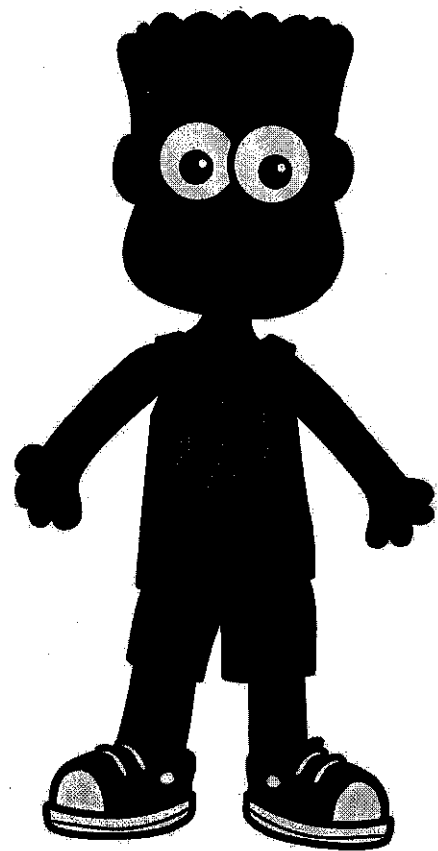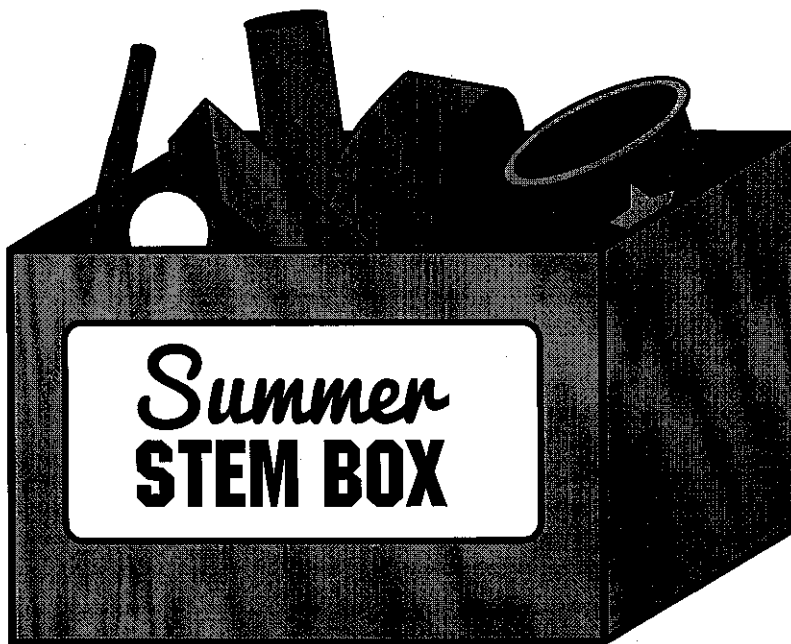WHAT CAN WE DO TO MAKE IT BETTER?

PUT TOGETHER A "SUMMER STEM BOX"

STEM Projects are a fun way to add a bit of education into your summer schedule...and a whole lot of fun! :-)

To create a Summer STEM Box:

1. Compile all or some of the materials listed and any others you'd like to add. Most are things you already have or can get at the dollar store!

2. Find a box, bin or basket to put them in.

3. Cut out the "challenge cards", fold them in half and place them in a jar. Kids can pull out a (random) card to get the challenge for the day!

These challenges are open-ended—the sky is the limit for creativity! They are great for individual or group work, maybe even a family competition!!

Summer
STEM BOX

Suggested Materials for your Summer STEM Box:

- Straws
- Pipe Cleaners
- Play Dough
- Ping Pong Balls (Table Tennis Balls)
- Marbles
- Army Guys
- Paper Cups (Dixie Size)
- Kitchen Sponges
- Tape (Masking, Duct, Scotch Tape)
- Craft Sticks (Popsicle Sticks)
- Plastic spoons
- Rubber Bands
- Milk Jug Lids
- Paper Clips
- Foil
- Paper (Construction, Card Stock, Printer Paper)
- Card Board (could be cereal or other packaging boxes)
- 50-ish Pennies (for testing)
- Paper Towel Rolls and Toilet Paper Rolls
- Bubble Wrap (?)

Design & create a really fun roller coaster for a ping-pong (table tennis) ball.

Create something that will keep an egg from breaking when dropped from 4 ft. ...or even higher!!

Build a catapult that will launch a marshmallow. How far can you get it to go?

Design & create a really fun slide for a marble.

Make a paper airplane that can carry pennies. See how far you can make it fly and how many pennies it can carry!

Create a floating raft for "army guys" (or other small toys). Experiment with different materials & designs. See how much cargo (pennies) your raft can hold until it sinks. Can you create a way for the raft to move on its own?

Design & build a play-ground for marbles... include all of your favorite playground equipment!

Make a ramp with 2 jumps for Hotwheels cars. Build one jump for your car to go far and the other to go high!

Build a bridge that can go between two chairs over the span of a foot. See how many small books it can hold!!

Build a tower out of just paper that can support a book. How many books can it hold? Try different shapes and sizes!

PLANNING SHEET

LIST OR SKETCH SOME IDEAS:

CREATE A DRAWING TO PLAN OUT YOUR DESIGN:

REFLECTION SHEET

WHAT WAS THE PROBLEM TO SOLVE?

HOW DID YOU SOLVE THE PROBLEM?

HOW COULD YOU IMPROVE YOUR SOLUTION?