QUADRILATERAL (SQUARE) IN SPACE

SCIENCE & MATHEMATICS STANDARDS

Inquiry	Measurement
Properties of objects and materials	Inferring
Making Graphs	Predicting
Abilities of technological design	Interpreting Data
Hypothesizing	Controlling Variables
Observing	Investigating
Communicating	Estimation
Measuring	Statistics
Collecting Data	Probability

PART I: DETERMINE ROCKET FUEL MIXTURE

NOTE: In the classroom students will be randomly given a liquid and effervescent tablet. They will complete the attached data sheet. Once all students have completed their data sheets, the information will be collated and provided to students.

OBJECTIVE: Determine the best mixture of effervescent tablet and liquid to achieve the maximum height of your rocket.

Material and Equipment:

Film Canister
Alka-Seltzer tablets
Generic effervescent tablets
Soda (Cold & Room temperature)
Bottled Water (Cold & Room Temperature)
Seltzer Water (Cold & Room Temperature)
Stopwatch
Paper Towels
Safety Glasses

Procedures:

1. Discuss with your team members what the best combination of liquid and tablet will provide the most thrust to achieve maximum height of your rocket. Pair up with a team member.

2. Fill the film canister ½ full of your liquid of choice. Have your team member get ready to time the chemical reaction. While your teammate times the reaction observe what occurs.

3. Place your chosen amount of effervescent tablet into the canister. Time the

reaction and record the time. Record your observations. Repeat the experiment by trading places with your teammate.

4. Discuss your results with the people at your table.

5. Repeat steps 1 -3 but this time you will place the lid on the container.

SAFETY NOTE: Take your liquid filled canister, tablet, lid, stop watch and safety glasses to the launch area. Everyone will line up on the safety line.

LAUNCH TIME

1. One at a time individuals will move to the launch line, put their safety glasses on, place the tablet in the container, and quickly put the lid on, set the container on the ground and step back. Individual's teammate will start the stopwatch as soon as the tablet is dropped into the canister. Stop the time once the canister launches.

2. Repeat until all individuals have launched their canister.

NOTE: In the classroom setting, students will launch a canister with a specific liquid and tablet amount and observe the height achieved.

To achieve accuracy of height achieved, canisters will be launched against a wall. Put a tape measure on each side of the wall with lines drawn between them at various heights. All observations of height will be recorded and provided to the students for analysis to determine the best formula to fuel a rocket.

PART II: CONSTRUCTION OF YOUR ROCKET

1. Individuals will be given instructions for two different origami rockets, 4 sheets of origami paper (2 - 6" x 6") (2 - 8.5" x 8.5").

2. Individuals will determine which origami sheet they want to use. Modifications will be allowed by the students if there is time. Students must include an explanation for their modifications in the final report.

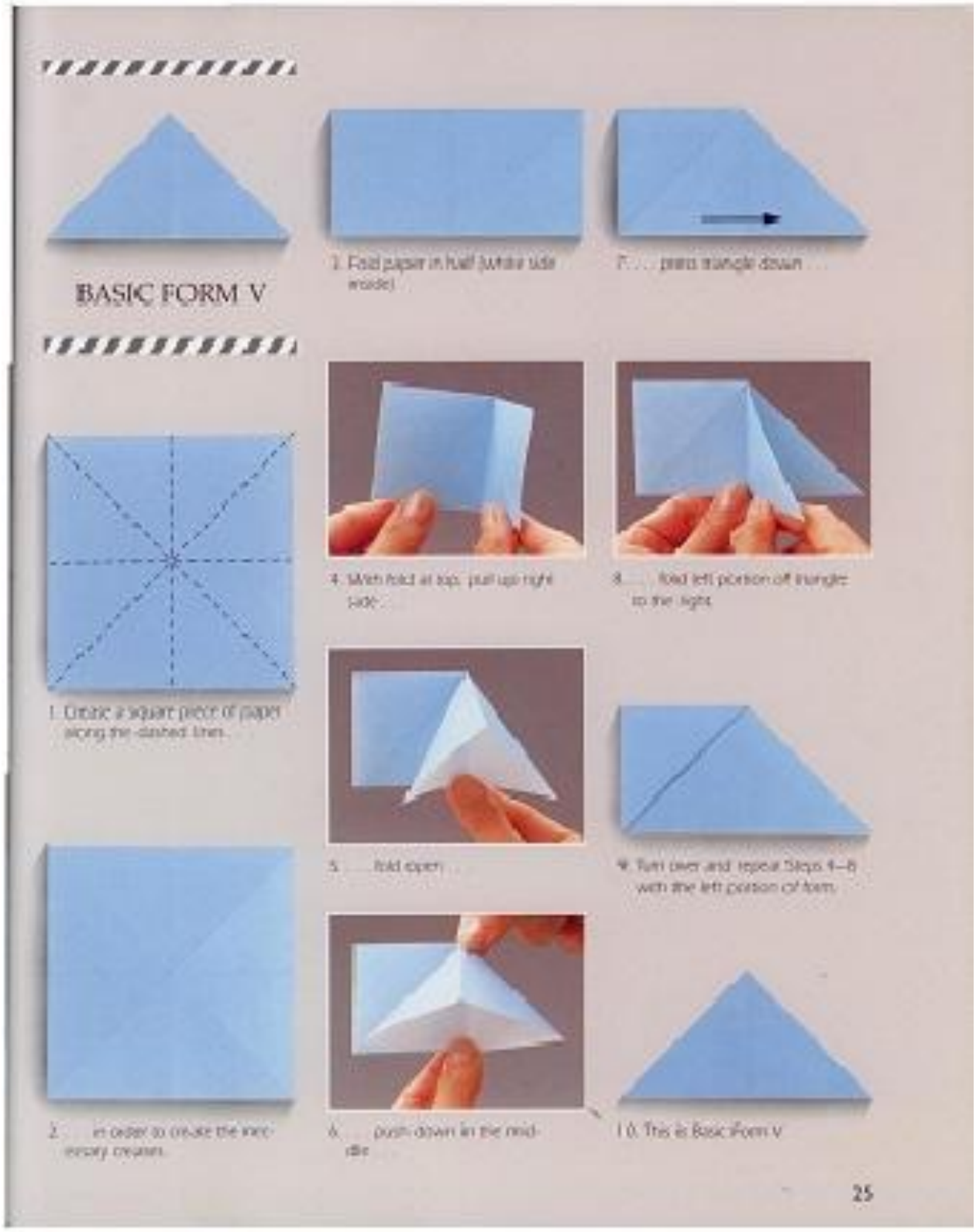
PART III: Extensions

1. Use of clinometers.
2. Using a Film Canister Launch Tube.

PART IV: Workshop Materials

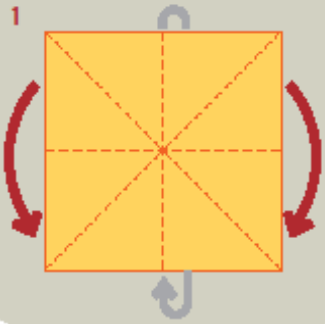
1. Workshop attendees will receive a CD with all handouts, black line masters, math and science standards, and a Film Canister Launch Tube with instructions.

Building a Origami Rocket



HOW TO MAKE AN ORIGAMI ROCKET:

1



2

3

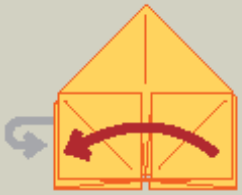
Fold over, so that the opposite sides are now exposed.

4

5

Fold over, so that the opposite sides are now exposed.

6



7

8

9

10

11

Fold over, so that the opposite sides are now exposed.

12