Technology

Names _____ Date _____ Period/Section _____

_____

Worth 100 pt.

Toothpick Bridges

1. Turn in the Toothpick Bridges Worksheet. Turn in both Graphs — **40 pts.** _____

2. Bridge is built according to the. bridge building codes — **20 pts.** _____

3. Building Plans match the finished bridge. — **20 pts** _____

4. The Bridges Strength when weight is added. — **20 pts.** _____

Technology

Toothpick Bridges

Congratulations!

Your construction team has been hired to build a bridge. Now the hard work of planning and construction must begin so that you can deliver the best bridge possible to your client.

Your bridge will be judged on two different criteria:

- The degree to which your bridge matches the architect's plans
- The strength of the bridge

The Task

Your company is hired to build a strong bridge according to plan. In addition to building your bridge, your team will gather information to make two graphs. One graph will compare the number of toothpicks estimated with the actual number used. The other graph will show how each group compares in building strength into the plans for their bridge.

The Process

You will begin by learning about the history of bridges and bridge structures. Construction companies of 3-4 students will be formed. The Bridge must meet the Bridge Building Codes, which will be provided.

The Test

Your bridge will be tested for strength by placing a bar across the middle of the bridge and hanging weights from the bar. The last weight that the bridge holds for 30 seconds is the weight recorded for the strength of the bridge.

Job Duties and Schedule

Company Name:_____

Project Director

Name: _____

Put check in box daily if job is being done

Keeps this schedule; makes sure all company members do their jobs.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Keeps Daily Journal of company's progress, recording any problems and their solutions. (Turn in daily journal).

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Makes sure construction sight is neat and organized.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Cleans up site and stores bridge each day.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Cleans out and keeps container of glue each day.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Architect

Name: _____

Designs bridge and draws plans.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Shows others how to construct bridge according to the plans.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Keeps inventory of building materials on hand at the site.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Makes sure actual bridge being built follows and looks like the plans.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Makes sure the bridge is ready for testing.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Carpenter
Name: _____

Builds bridge according to architect's plans.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Consults with architect as building proceeds.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Supervises the company members who help with construction (construction workers).

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Construction Worker(s)
Name: _____

Helps carpenter build the bridge.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Get supplies. Supplies are no more than 100 toothpicks and glue.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

Makes sure Bridges Worksheet, including the graphs and hypotheses are completed.

Day 1 Day 2 Day 3 Day 4 Day 5

☐ ☐ ☐ ☐ ☐

If there are 5 people in a group then two people are construction workers. Add the second construction worker to the daily checklist.

Each job is worth 15 pts.

Technology

Names _____ Date _____ Period/Section _____

_____

Worth 100 pt

Bridges Worksheet

Name of construction company

_____ (5pts)

COLLECT DATA

A. Compare the estimated vs. the actual amounts of toothpicks used for each group. (5pts)

Data	Company 1	Company 2	Company 3
Toothpick estimate	_____	_____	_____
Toothpick actual	_____	_____	_____

	Company 4	Company 5	Company 6
Toothpick estimate	_____	_____	_____
Toothpick actual	_____	_____	_____

B. List two factors your group used in the bridge design to make the bridge stronger: (5pts)

_____

_____

Use one of the above reasons to write a hypothesis about the main factor contributing to the strength of your bridge. (Ex.: The shorter the length of the bridge, the stronger the bridge will be). (5pts)

To test our hypothesis, we would need to know

_____

and _____ for each group's bridge.

Data	Company 1	Company 2	Company 3
_____	_____	_____	_____
_____	_____	_____	_____

Data	Company 4	Company5	Company 6
_____	_____	_____	_____
_____	_____	_____	_____

DISPLAY DATA

A. Make a bar graph showing how the toothpick data compares for each company. (10pts)

B. Does the data support your hypothesis? Explain. Make a graph to show how this data compares for all companies. You can choose any type of graph that you feel will best represent your data. (10pts)