

Digital & Print resource

Key Information Sheet

TEACH
to
DREAM

Teacher Information

Design, Engineer and Build resources have been created to help middle school students engage with STEM/STEAM. Students use their scientific/engineering, technological, mathematical skills to help problem solve and create an end product. They are then able to use their artistic skills to help create a design/look that will appeal to their targeted audience.

Items needed to successfully run each challenge:

The resources used are readily available in most classrooms or can be purchased at a local shop. You can negotiate with your students about additional materials or take one out if you don't have access to it (tell the students the company is currently out of supply ☺)

Tape	Glue	Paper
Cardboard	Popsticks/craft sticks	Straws
Cups	Scissors	String

Time frame required:

These projects can run for as little or as long as you like depending on your lesson requirements. It generally would take a minimum of 30 minutes to complete. You can extend the students thinking and ask them to re-evaluate and improve if you have significantly longer time. On the student sheet they are asked to circle the time frame they have been given to complete the task.

On this student sheet it also has a space for the maximum model size. You can set this depending on the size or paper/ cardboard and space you have to display the end products.

Restrictions:

To make it more realistic the students are required to work within boundaries. They have a set budget of either \$100 or \$1,000 (allowing you to cater for all learning levels). The students can then either keep a tally of their expenses using the table or coupons provided. You may also decide to 'fine' your students for unsafe practices (ie going into another construction zone - another group's work area, not using equipment properly etc).

Links to other curriculum areas:

- Geography
- Health (group work/ social skills)
- English

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and
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Slides

Build a Famous Landmark in Your own Local Area

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Design Engineer & Build!

FAMOUS LANDMARKS

Working with numbers up to 100



The Scenario: A new display is opening at the local complex showcasing famous landmarks of the world in miniature form. They have asked you to join the design team.



The challenge: To design and create a scaled model of a famous landmark.



What will your scale be? (ie 1cm = 1m)
How will you decide upon your famous landmark (will it be one of the 7 Man made Wonders of the World or a local attraction in your country?)
How will you make it sturdy?
Will it be able to stand by itself or need another structure for support?
How will you ensure it looks like the original?

Your Budget: \$100

Material costs:

Material	Cost
Straws	\$1 each
Tape	\$1 per 5cm (2 inches)
Glue	\$1 per 10 mins
Cardboard	\$15 per sheet
Paper	\$10 per sheet
Pop sticks/ craft sticks	\$1 each
Cups	\$2 each
Other	

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Design Engineer & Build!

LANDMARK Worksheet

Complete the set amount

(circle the time allocated)

of resources, no excessive use

bigger than



allowed on the construction

up's construction sites (do procedures

and withstand basic

people to be able to

mark?

ensure your design

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PDF
and
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Slides

4 Levels of Differentiation

Cater for all students with \$100 & \$1,000 budgets and construction

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FAMOUS LANDMARKS

Working with numbers up to 100
* Construction Worker Costs included



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FAMOUS LANDMARKS

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Group Planning Sheets

 **DESIGN ENGINEER & BUILD!** 

FAMOUS LANDMARKS Student Worksheet

My Budget: \$100 or \$1,000 (circle the set amount)
My Timeframe: 30 60 90 minutes (circle the time)
Co-workers (Team Members): _____

Restrictions:

- Remember you must use a range of resources of one material.
- The finished product must not be bigger than:
Height: _____
Length: _____
Width: _____

Safety:


- Only a maximum of 4 co-workers are allowed on the construction site (your work area).
- You need to stay away from other group's construction sites (do not interfere with their building process).
- Use all materials with the correct safety procedures.


Quality Control:

- Your famous landmark needs to be sturdy and withstand basic weather conditions. (wind- gentle blowing)
- Ensure that it correctly to scale, to allow people to be able to determine the true dimensions of the original.



Design:

- How will your design reflect the original landmark?
- What materials and processes will you use to ensure your design is sturdy?



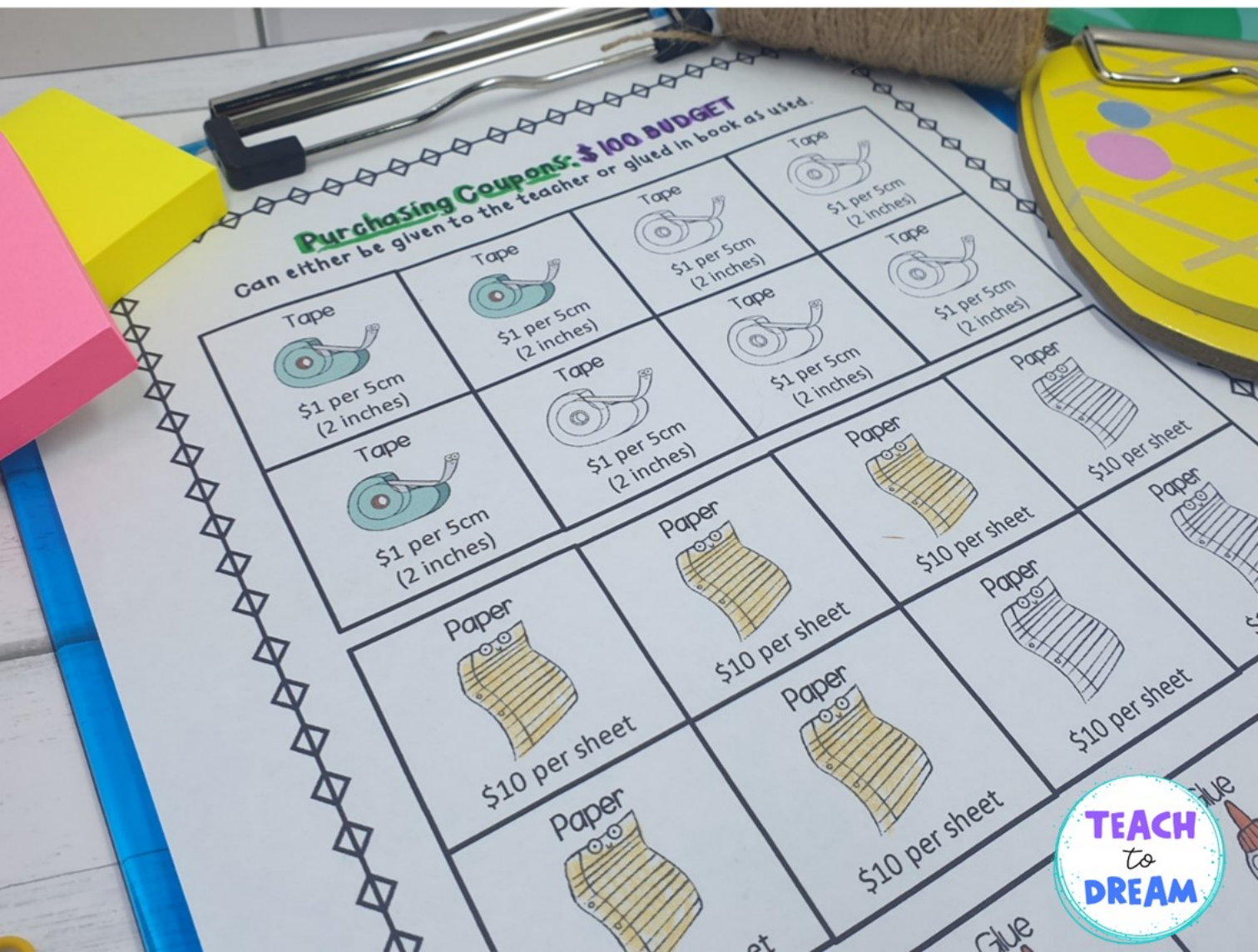
Student Worksheet: 

Material	Individual Cost	Quantity	Total Cost

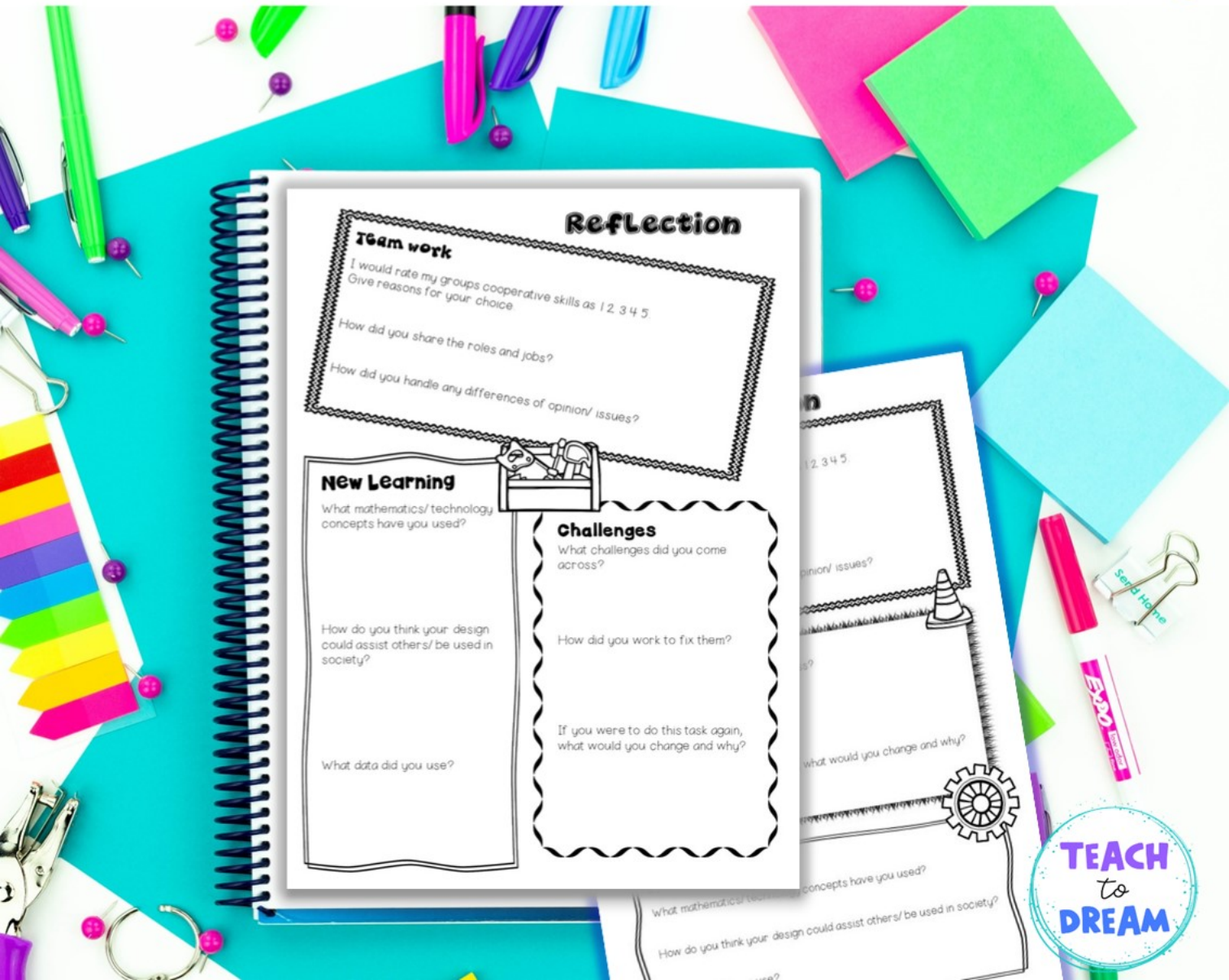


TEACH to DREAM

Have students work within a set budget



Encourage groups to Reflect on their learning



Reflection

Team work

I would rate my groups cooperative skills as 1 2 3 4 5
Give reasons for your choice

How did you share the roles and jobs?

How did you handle any differences of opinion/ issues?

New Learning

What mathematics/ technology concepts have you used?

How do you think your design could assist others/ be used in society?

What data did you use?

Challenges

What challenges did you come across?

How did you work to fix them?

If you were to do this task again, what would you change and why?

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Quick & Easy Assessment

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FAMOUS LANDMARKS

On task learning	/5
Working out	/5
Correct calculations	/5
Team work	/5
	/20

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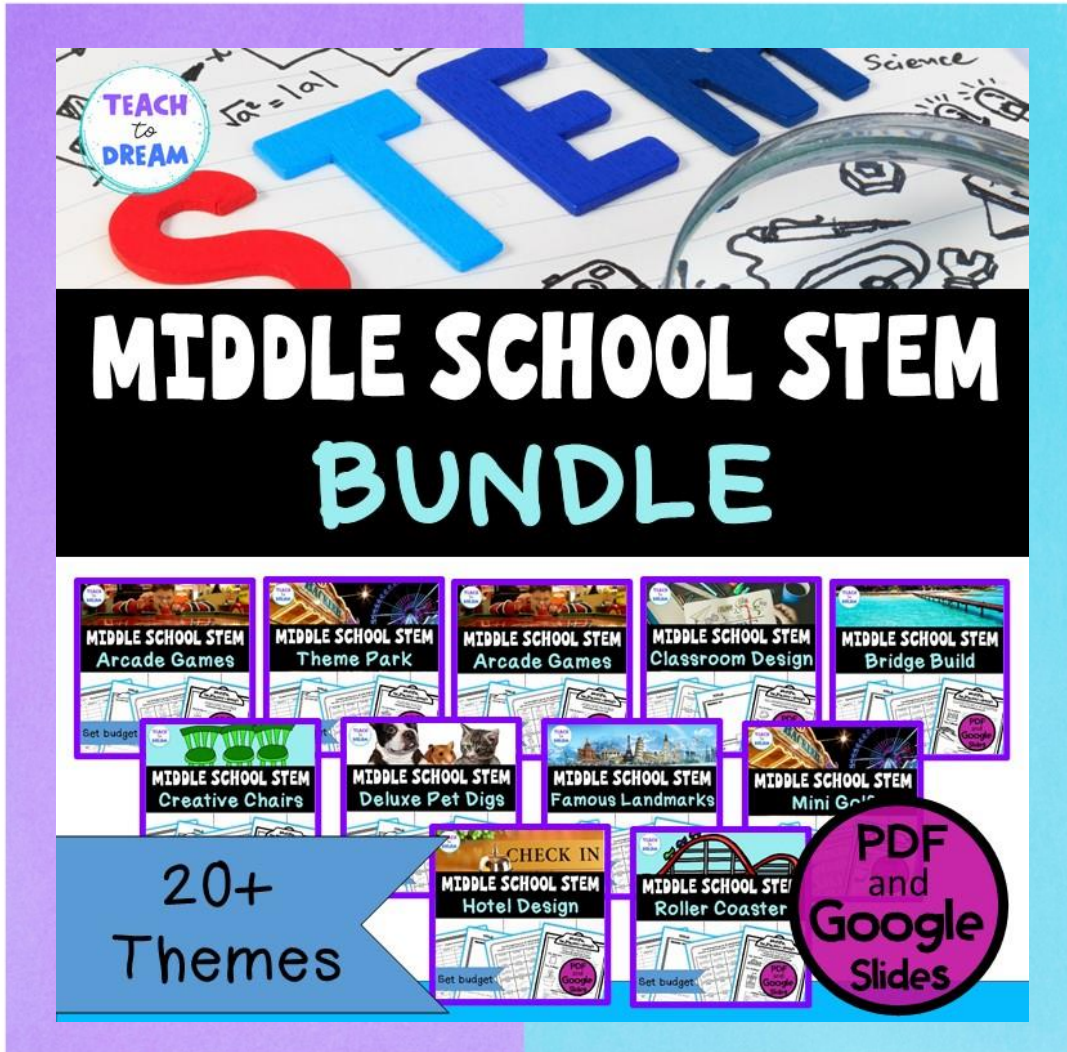
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FAMOUS LANDMARKS

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Interested in More Middle School STEM?



TEACH to DREAM

STEM

Science

MIDDLE SCHOOL STEM BUNDLE

MIDDLE SCHOOL STEM Arcade Games

MIDDLE SCHOOL STEM Theme Park

MIDDLE SCHOOL STEM Arcade Games

MIDDLE SCHOOL STEM Classroom Design

MIDDLE SCHOOL STEM Bridge Build

MIDDLE SCHOOL STEM Creative Chairs

MIDDLE SCHOOL STEM Deluxe Pet Digs

MIDDLE SCHOOL STEM Famous Landmarks

MIDDLE SCHOOL STEM Mini Golf

MIDDLE SCHOOL STEM Hotel Design

MIDDLE SCHOOL STEM Roller Coaster

20+ Themes

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