

BRIDGING MARYLAND, BECOMING ENGINEERS

KNOWLEDGE SPLASH

(Complete Prior to Part 1)

Name: _____ Date: _____

Take three minutes and write down all the words you can think of relating to bridges and bridge design.



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Name: _____

Part 1- Guided Notes

The Engineering Design Process involves:

- Identifying a _____
- Brainstorm solutions
- Select a _____
- _____ a model or prototype
- _____ and evaluate
- Optimize the design
- _____ the solution

Bridges can be built over water, _____, or roads.

The size of a bridge size depends on its location.

Design constraints further influence the bridge design. Design constraints can include:

- Strength
- Navigation
- Safety
- Costs and material longevity

For the Salisbury Boulevard bridge, the design constraints required by Chief Engineer Hopkins included:

- Resistance to rust, rot, and _____
- More durable than just concrete
- Strong enough to withstand _____ and floods
- Strong and wide enough to carry multiple lanes of _____ cars and trucks
- Aesthetically pleasing
- Not too _____; considerate of cost

Four different bridge forms are: slab, truss, _____, and suspension

Materials used in bridges include: wood, iron, stone, _____, and steel.

A bridge deck is supported by bridge abutments and sometimes _____.

A timber-concrete composite bridge is made from both _____ and _____.

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DESIGN SELECTION EXERCISE - Complete After Part 1



Name: _____

Date: _____

Below are four types of bridges that might have been brainstormed ideas for the Salisbury Boulevard bridge.

The chief bridge engineer identified eight desired characteristics for the bridge.

Place a check mark in the box if the characteristic is met. Place a question mark if you do not know the answer.

	Rust resistant	Can not be eaten by insects	Rot resistant	Can withstand floods	Can withstand hurricane winds	Wide enough to carry multiple traffic lanes	Durable	Cost-effective	Aesthetically pleasing			
Wooden covered bridge												
Metal truss bridge												
Concrete arch bridge												
Timber-concrete composite bridge with treated wood												

Which alternative do you think meets the most desired characteristics? _____

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BRAINSTORM SOLUTIONS

(Complete prior to Part 2)

Name: _____ Date: _____

Make a quick sketch of a bridge you would design for Salisbury Boulevard in 1937.



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Name: _____

Part 2- Guided Notes

The Engineering Design Process is _____. This means that a process involves repeating parts to improve the outcome. The steps are not simply a straight ladder. The process requires improvement on the experiment.

James Seiler developed a slab deck form of a timber-composite bridge in the early in the decade of the _____.

He used _____ different sizes of chemically treated wood boards, connected them with nails, and covered them with _____.

This form could be expanded to any width or length. Seiler tested his designs in a _____.

Seiler shared his solution through publications and applying for a _____ from the United States Government.

Challenge Part 1:

The East Branch of the Wicomico River was channelized, and its banks were held by a timber bulkhead. The timber bulkhead could serve as the _____ for the Salisbury Boulevard bridge.

_____ help engineers determine what the ground is like at a specific location.

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SHARE YOUR SOLUTION

EXIT TICKET

(complete after Part 3)

Name: _____ Date: _____

1. Make a labeled drawing of your bridge design.

2. Write about how your tested it.

3. Write about how you made it better after testing it, and what you might change if you built another bridge.

4. Essential Question: How are bridges shaped by properties of their functions? How are they shaped by design constraints?