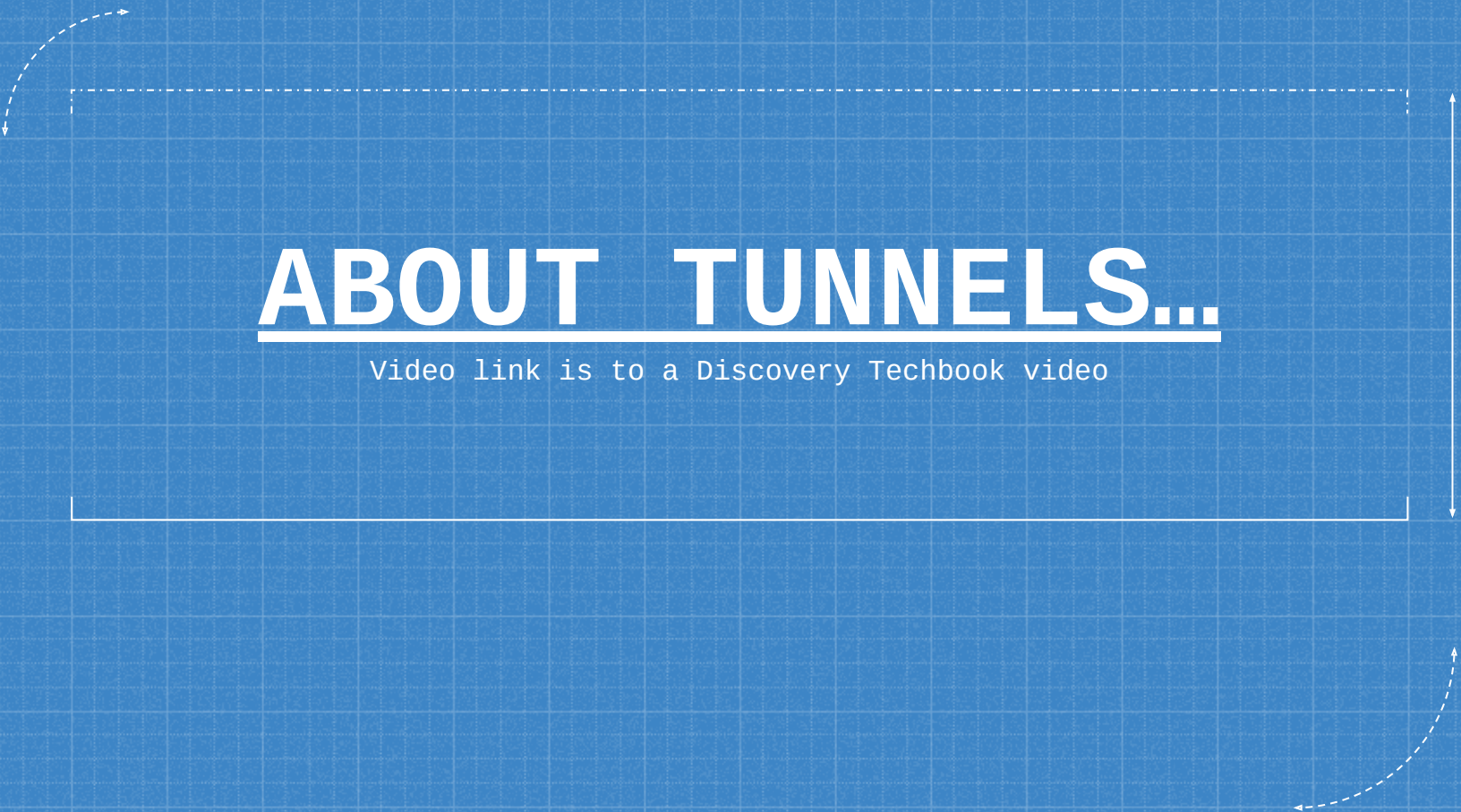




TUNNEL DESIGN CHALLENGE



ABOUT TUNNELS...

Video link is to a Discovery Techbook video

CALLING ALL ENGINEERS....

- You have been selected as the top engineering teams in the country to build a tunnel around a major city.
- There are 3 potential sites to choose from.
- You need to complete the following tasks:
 - Choose the best site for building a tunnel based on what you know about rocks.
 - Brainstorm your drilling method. Each group will be split into two "drilling teams" using two different methods.
 - Estimate the time it will take to get to the center of the tunnel.
 - Design and build a prototype of the tunnel.
 - Test your tunnel.
 - Make changes, if needed. Test again.
 - Record all data and present findings to class.

Testing Criteria



Water Test

Does the tunnel leak? Are there any cracks that occurred during construction? We will test your tunnel by pouring water over it to see if it leaks.

Strength Test

How strong is the tunnel? What is its structural strength? We will test your tunnel by placing heavy objects on top of it to see how it holds up.

Other Things to Consider...

1. Tunnel must measure at least 4 cm wide by 6 cm high and go completely through the mountain.
2. Less materials are better.
3. Environmental factors- the tunnel does not change the mountain structure.
4. It is important to work together, communicate effectively, think creatively, and remember that failure makes you better.

Tunnel Site 1: Talc Region

- Talc is usually green, white, gray, brown, or colorless.
- It is a translucent mineral.
- It has a pearly luster.
- Talc has a greasy, soapy feel.
- It is the softest known mineral- on Moh's Hardness Scale from 1 - 10, it is 1.
- It is a metamorphic rock.
- It has a variety of uses, but you may know it in baby powder.



Tunnel Site 2: Claystone Region

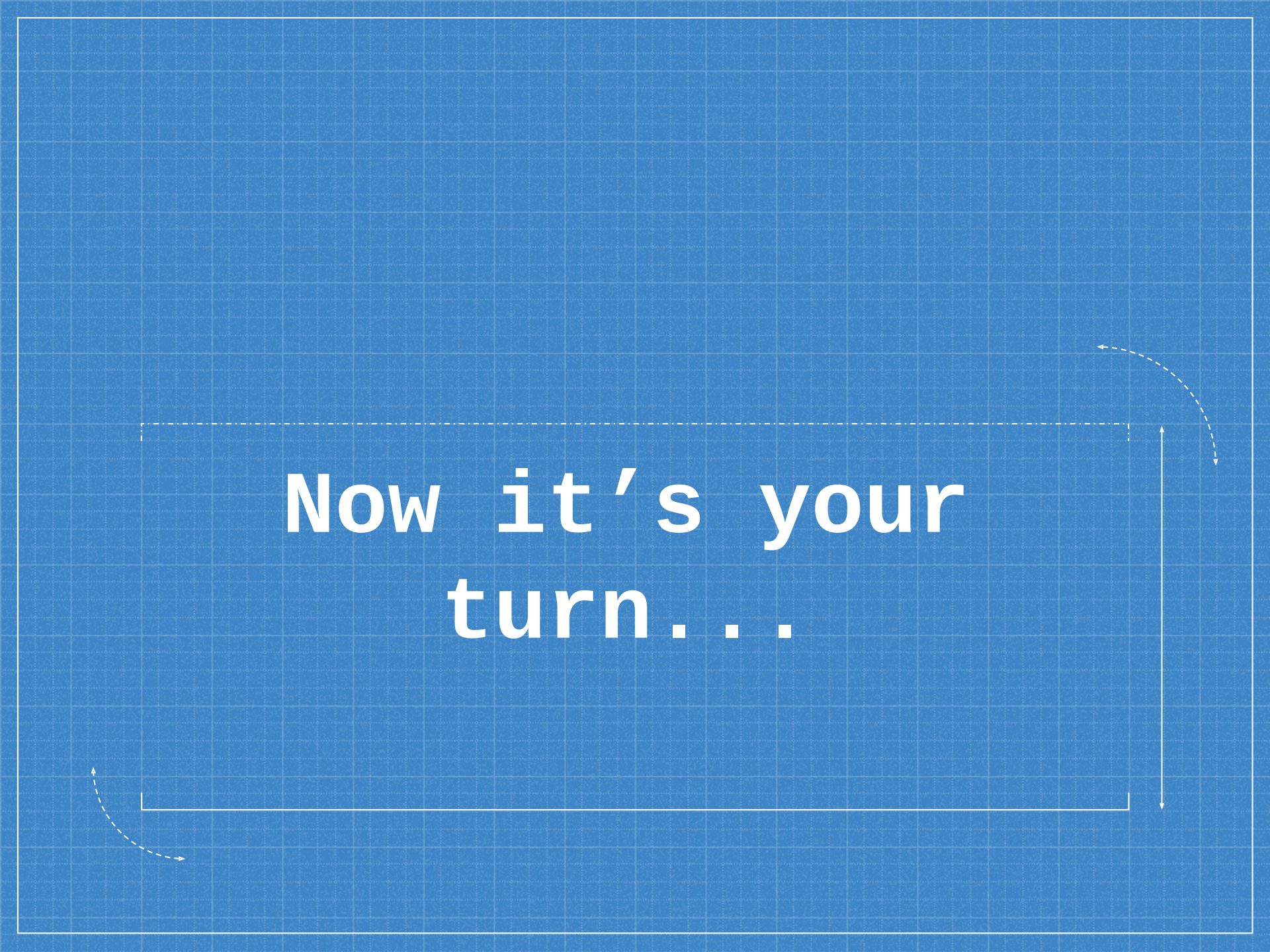
- Claystone rock that is hardened clay.
- Claystone streaks white.
- It is made up of fine grains.
- Claystone's luster is dull.
- It is a sedimentary rock.
- It's color can vary from yellow, orange, red, brown, green, and gray.
- It is a 3.5 - 4 on Moh's Hardness Scale.



Tunnel Site 3: Granite Region

- Granite is an igneous rock with large grains.
- Mainly composed of quartz.
- Granite usually looks red, pink, gray, or white color with dark mineral grains.
- It is a 7 on Moh's Hardness Scale.
- It's luster is dull to grainy with some parts that are pearly.





**Now it's your
turn...**