

TRANSPORTATION



Activity Pack

SPRING BREAK 2024 EDITION



Oregon
Department
of Transportation

Learn about the Historic Columbia River Highway

The Columbia River Gorge is a part of Oregon and Washington that has beautiful scenery, but tricky terrain. During the 1800s, it was hard for people to navigate this area as they went west to the Willamette Valley. An early road was cut for wagons in the 1850s, but the road was messed up when railroad tracks were laid in the 1880s.

A rich businessman named Sam Hill and an engineer named Sam Lancaster went to Europe and saw pretty highways there. They wanted to make one like that in Oregon.

Bringing their dream to life

To make this happen, Hill asked Lancaster to build a test road at Hill's Maryhill Estate, in Washington. They showed their prototype to important people who liked it enough to let them begin their great project.

Constructing a highway

Lancaster worked hard to plan the road so it would go by all the neat parts like waterfalls and canyons. Most of the highway's work was done by hand, using horses and wagons. They also used big machines like steam shovels and dump trucks.

Lancaster watched over the work in Multnomah County, and another person he taught, John Arthur Elliot, did the same in Hood River and Wasco Counties. One challenge Elliot faced in Hood River was making a tunnel that would remove steep grades around Mitchell Point. Elliot solved this by making a tunnel that had many windows. The design was inspired by a tunnel in Switzerland. He also made the Mosier Twin Tunnels.

Skilled stonemasons from Italy built beautiful walls, bridges and barriers along the road.

The Columbia River Highway opened on June 7, 1916. It was the first scenic highway in the United States. Lancaster used engineering to make sure the road was safe and easy to drive on with gentle slopes and wide curves. Many people came to see how pretty the Gorge was because of this road.

Over time, cars changed, and the road became old and not useful anymore. After Interstate 84 was built to handle more cars and trucks, parts of the original highway were cut into pieces or abandoned. But many people missed the beauty of the old road.

Now, inspired by Lancaster's and Elliot's engineering achievements, we are helping restore sections so people can use it again as a trail for biking and walking.

Key Words

Terrain is the shape of the land or ground, including things like hills, mountains, valleys and rivers.

Navigate is finding a way to go from one place to another.

Engineer is a person who designs and builds roads, bridges and machines. They use their knowledge and skills to solve problems and create new inventions.

Highways are big roads that connect major towns or cities.

Prototype is the first design of a solution to a problem or invention.

Canyons are deep valleys with steep sides, often formed by a river running through an area for a long time.

Steep grades are roads or paths that go up or down sharply, like a rollercoaster. They can be hard to climb up or go down safely.

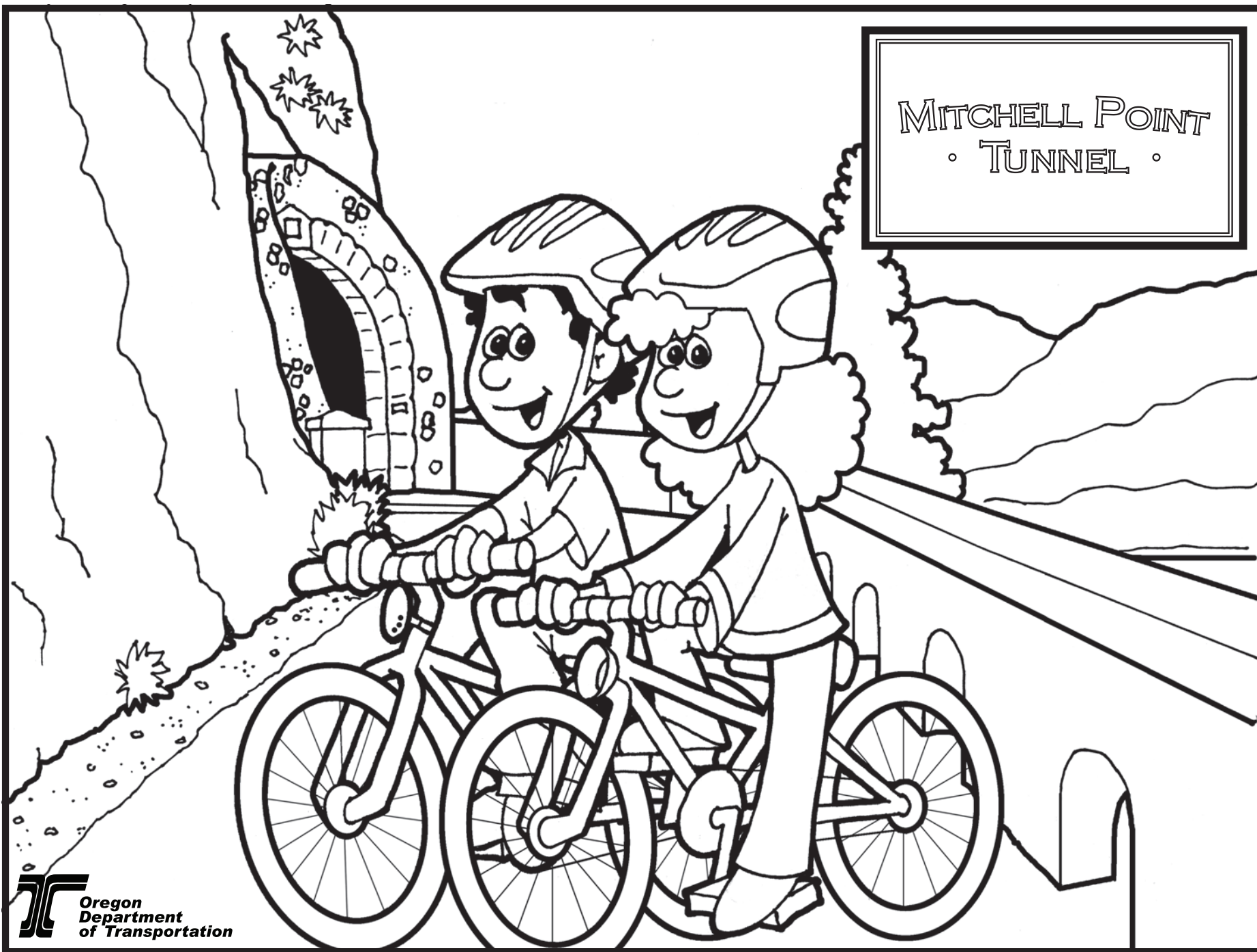
Stonemasons are skilled workers who use special tools to cut and shape stones. They build bridges and buildings by carefully placing stones together.

Scenic highway is a special road that goes through beautiful places, like mountains, forests, or along a river. Scenic highways show off natural beauty, making them fun to drive on and see the sights.

Slope is ground that is not level or flat. Slopes can be gentle or steep, depending on how much they go up or down. In math, a slope is like the slant or tilt of a line on a graph.

Restore means to fix something that is broken or old so that it is like new again. It's giving something a makeover to make it work or look better.

MITCHELL POINT
• TUNNEL •



Engineering Vocab!

Engineers love to find solutions to problems. They have a vocabulary that describes some of the work that they do when they encounter a problem and try to come up with the best possible idea to solve the problem.

Here's a problem for you: we have the definitions of 13 terms that engineers use. The problem is, the original word is scrambled! If you can unscramble the words and then match each word to its definition, you may be on your way to becoming an engineer!

Conde B. McCullough was an American civil engineer primarily known for designing many of Oregon's coastal bridges on U.S. 101. He worked for the Oregon Department of Transportation from 1919 to 1935 and 1937 until he died in 1946.



1. ACORNSTINTS _ _ _ _ _
2. CIRRITEA _ _ _ _ _
3. CDISSUS _ _ _ _ _
4. CATREE _ _ _ _ _
5. INNERGEE _ _ _ _ _
6. MOVERPI _ _ _ _ _
7. POETRYPOT _ _ _ _ _
8. PETSSIR _ _ _ _ _
9. ANLP _ _ _ _
10. OLDME _ _ _ _ _
11. ERRPEEVES _ _ _ _ _
12. ROBINSMART _ _ _ _ _
13. BELPROM _ _ _ _ _

- A. To think about many ideas when solving a problem.
- B. What the design needs to do in order to be successful — its requirements.
- C. The limitations on the design.
- D. To make something.
- E. To talk together to share your ideas.
- F. A person who solves problems.
- G. Make changes to have a better design.
- H. Miniature or simplified version of your design.
- I. To continue doing something even when its difficult.
- J. To keep doing something even when there is no guarantee you will be successful.
- K. A drawing or outline of possible solution(s).
- L. Something that can be solved.
- M. The first design of a solution.

Safe Routes to School!

We're all about getting students safely to school, and we're pretty fond of buses, too. Help this student get to his bus. Only one of these paths (A, B, C, D, E or F) will get him there.

Which one?



A

→	→	↓	→	→	→	→	→	↓
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B

→	↓	→	→	↓	→	↓	↓	↓
---	---	---	---	---	---	---	---	---

C

↓	→	→	←	←	↑	→	↓	↓
---	---	---	---	---	---	---	---	---

F

↓	↓	↓	↓	←	←	↓	→	↑	→	↓
---	---	---	---	---	---	---	---	---	---	---

E

↓	→	↓	→	↑	→	↓	↑	←	↓	←
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D

→	↓	→	→	↑	↑	→	→	↑	★	FINISH
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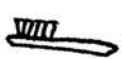
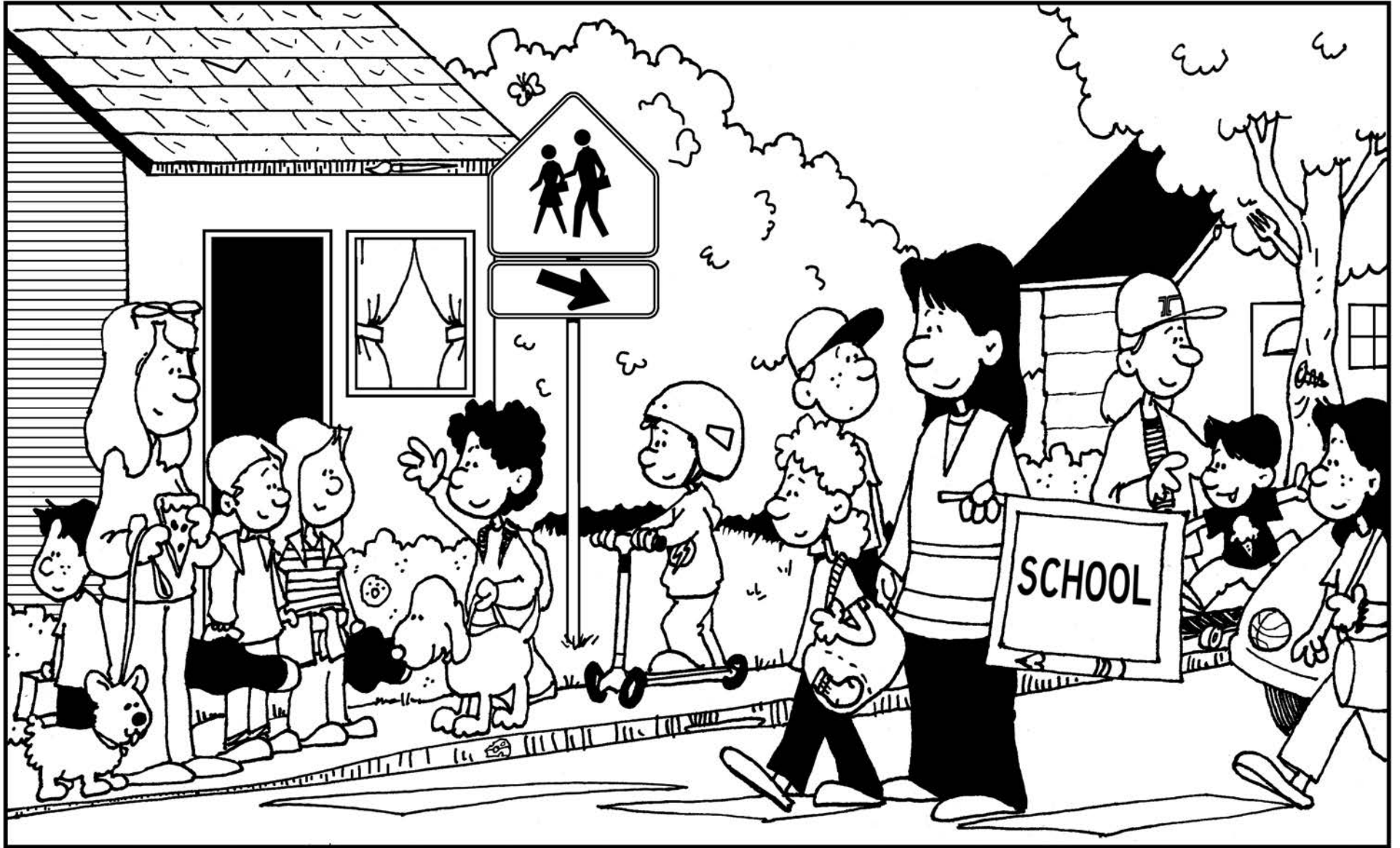
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→	→	↑	→	→	→	↑	←
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Look around!

To stay safe in school zones, it's important to pay attention and look around!
Look carefully at this picture and find the hidden objects below.



Toothbrush

Basketball

Donut

Pizza

Envelope

Paintbrush

Cheese

Screw

Butterfly

Fork

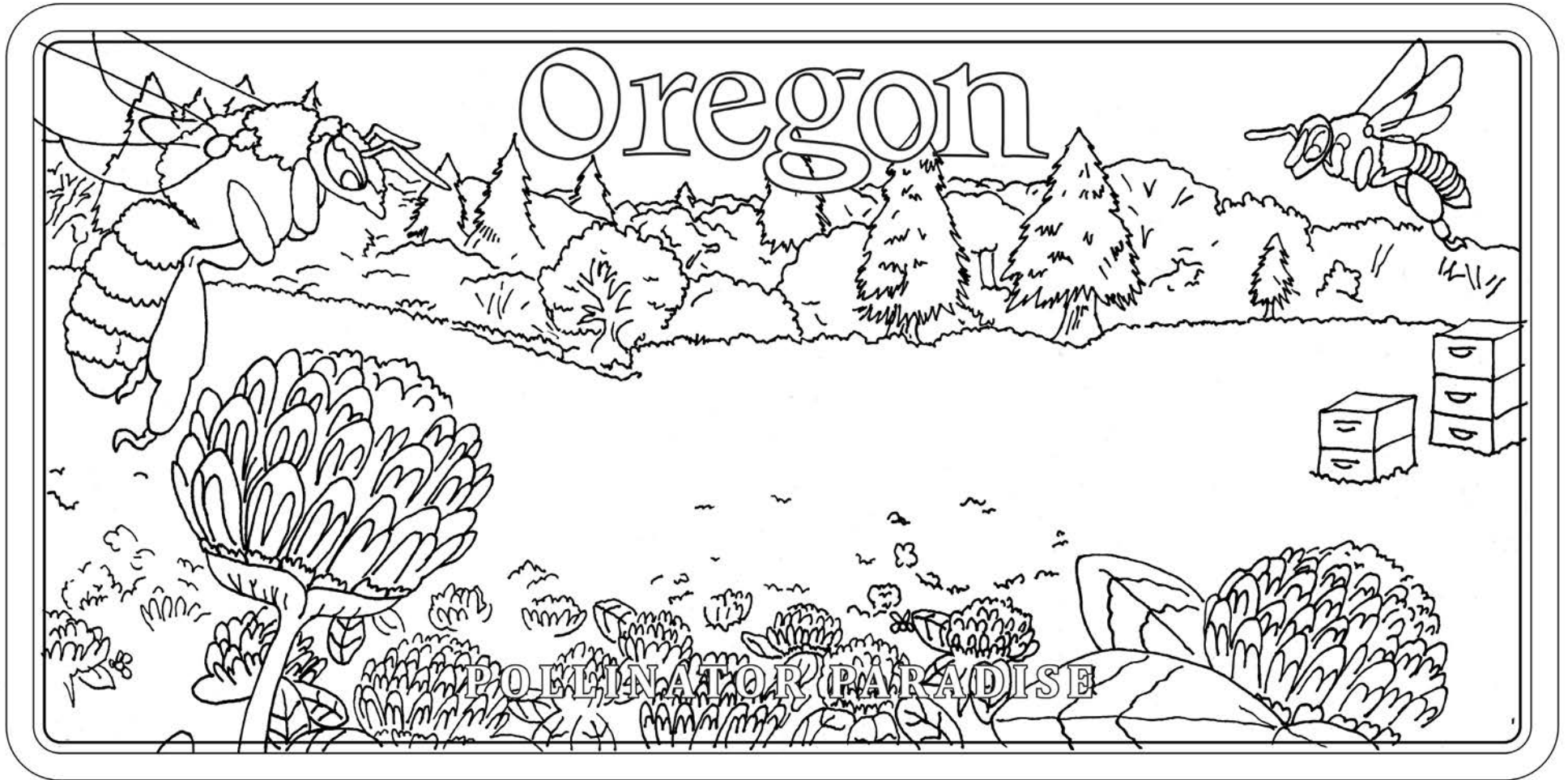
Sock

Ice Cream

Pencil

Making a buzz!

Our new buzz-worthy license plate supports pollinators, including the 600 species of bees found around the state. Each pollinator plate helps provide funding for Oregon State University's Pollinator Health Lab and Honey Bee Lab programs. They first hit Oregon highways in 2023.



Color our world!

The "Oregon Gray Whale" license plate went on sale in February 2019. The plates cost \$40 to order or renew, with approximately \$35 of each sale going to OSU's Marine Mammal Institute based at the Hatfield Marine Science Center in Newport.



Born to be wild!

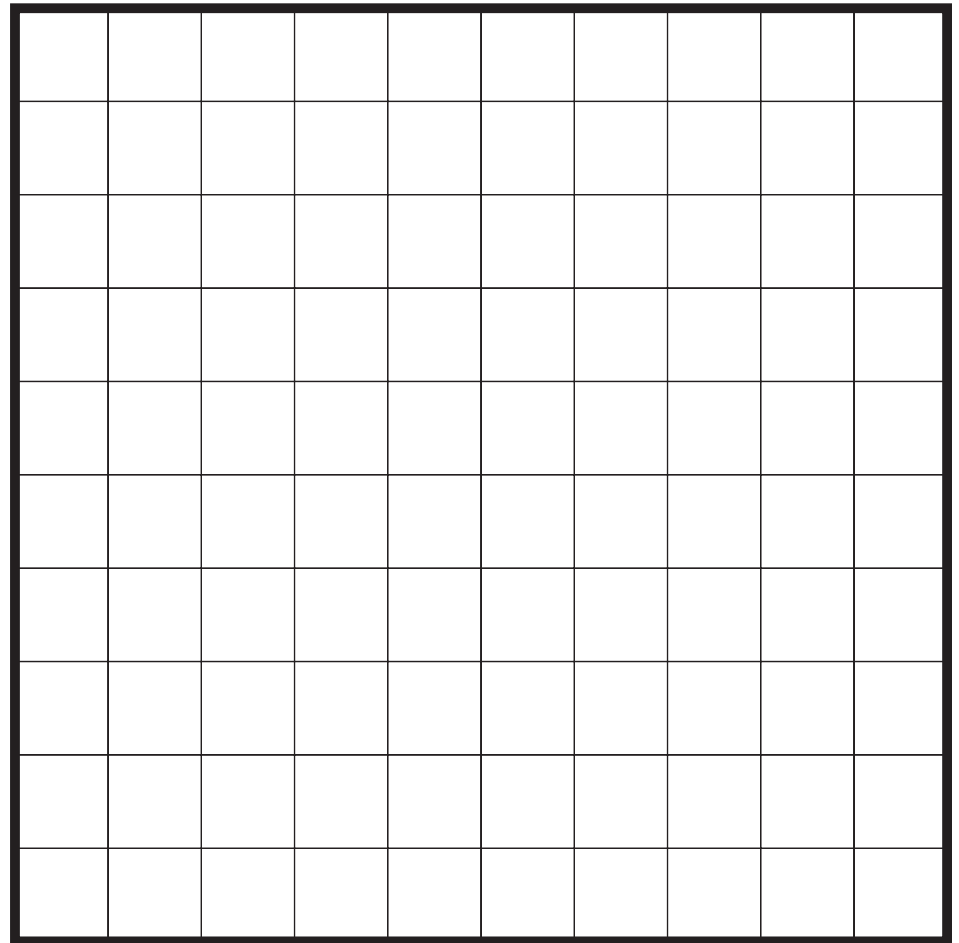
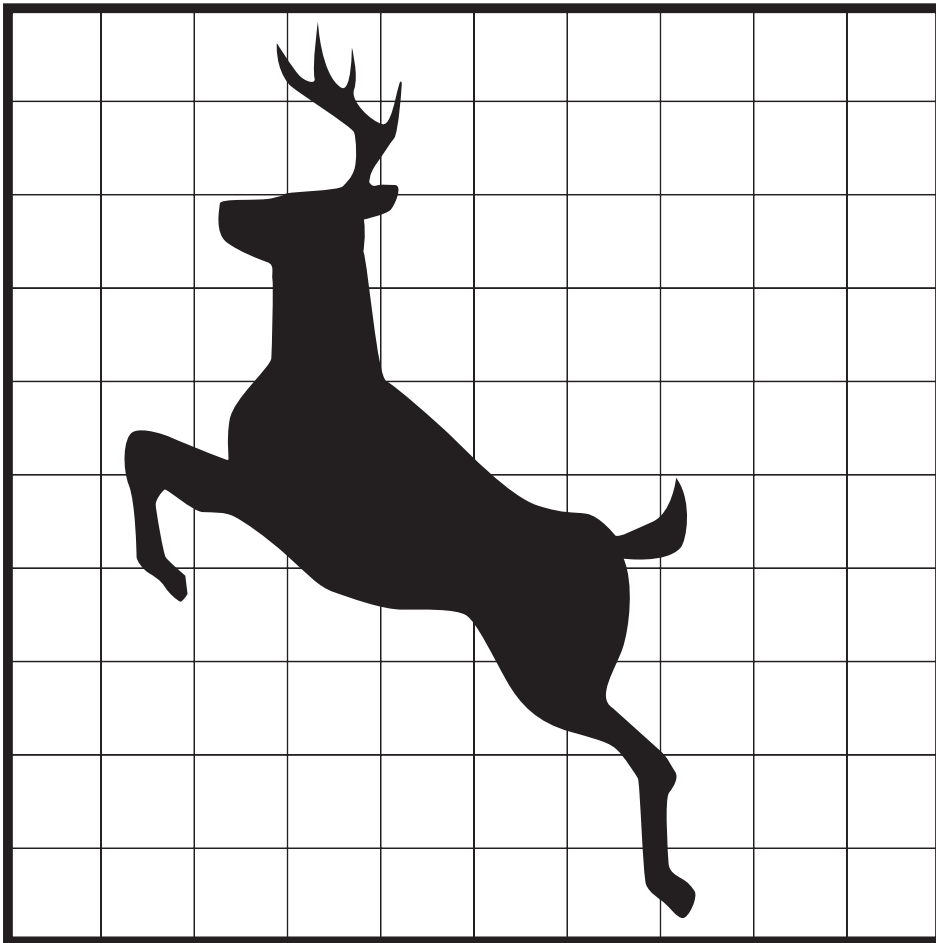
The “Watch for Wildlife” license plate is one of the newest plates in Oregon. It went on sale in May 2022. Proceeds from the sale of this plate are dedicated to projects that provide safe passage to wildlife of all kinds throughout Oregon.



Watch for Wildlife!

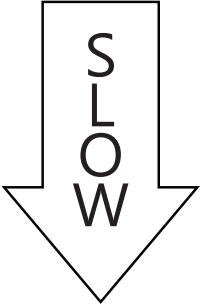
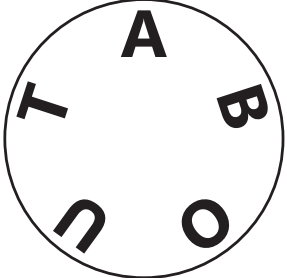

Slow down! Deer crossing signs help keep deer and humans safe, preserve nature and prevent accidents. These signs give drivers warning, so they know to be on the lookout for animals on the road.

Use the grid below to draw the deer from the sign!



What did you say?

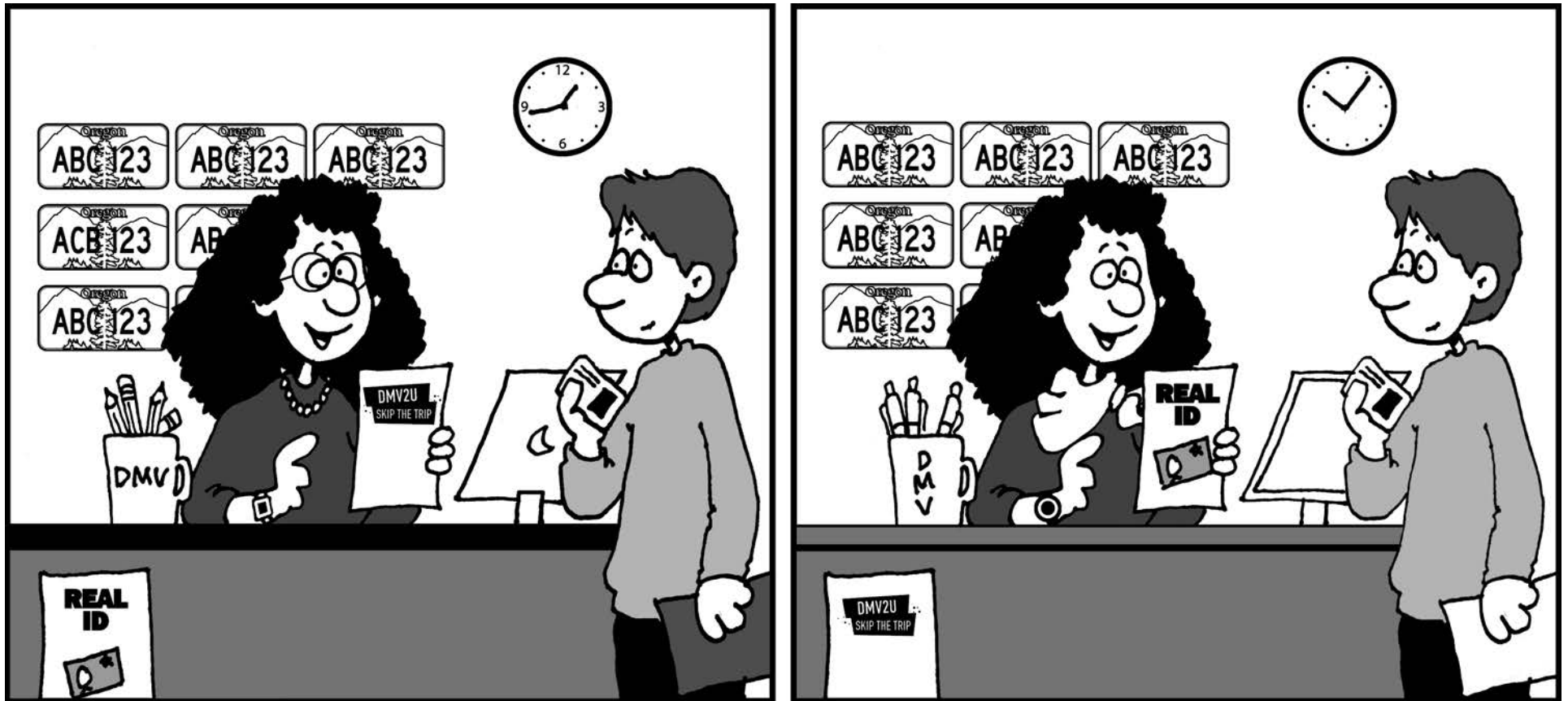
They say a picture is worth a thousand words. But how much is it worth when the picture is your word? Each square below shows a common transportation-related word or phrase. Use the clues in the pictures to solve each puzzle

	VOLUME TRAFFIC	RED AMBER GREEN	EXIT	W WALK L K
cycle cycle	V E H I C L E S	↑ ↓ REST ← → $l \times w =$	MIRROR	TRANSIT
	GROUND CULVERT		SPEED	← line → ↑ ↓

A trip to DMV

We have DMV offices all over the state. Each one is a little bit different. But you don't always have to go to a DMV office to get your work done. You can also take care of a lot of things on our website, DMV2U!

Spot the differences between these two pictures of a DMV office.



STEM challenge: Build a bridge!

Toothpick Bridge Building

Building a toothpick bridge is a fun way to learn about structures and engineering. Experiment with different designs and materials to create the strongest bridge you can!



Gather Your Materials

- Toothpicks (we recommend two boxes per person)
- A package of spice drops or marshmallows
- Flat surface to work on
- Something to test weight limit (small toys, soup can, etc.)
- *Optional:* Graph paper (for pre-planning)
- *Optional:* Wax paper to use as a bridge-building surface
- *Optional:* Cars to drive under the bridges

Plan Your Design

Think about how you want your toothpick bridge to look. Draw a simple sketch of your design.

Start Building

Use the marshmallows or spice drops as connectors between the toothpicks. Stick one end of a toothpick into a marshmallow/spice drop to join them together.

Tips for a Strong Bridge

- Make sure the toothpicks are placed close together for support.
- Use extra marshmallows/spice drops at the joints to make them stronger.
- Create triangles in your design, as triangles are very strong shapes in structures.

Test Your Bridge

- Carefully place your toothpick bridge on a flat surface.
- Slowly add lightweight objects like small toys to see how much weight your bridge can hold.

Improve Your Design

- If your bridge isn't strong enough, try adding more toothpicks or marshmallows for extra support.
- Make adjustments to your design based on what you learned during testing.

Record Your Results

- Write down how much weight your toothpick bridge could hold without breaking.
- Draw a picture or describe what you would do differently next time to make your bridge even stronger.

Rate Your Design



- What did you like about your design?

- What would you do to improve it next time?

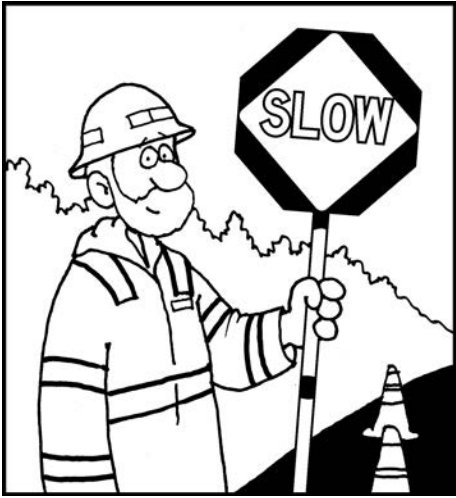
Follow up Analysis

- Which bridge design held up the best? Which was the worst? Why?
- What design concept or shape did the most and least successful bridges follow?
- What are some real-world bridges that follow these design principles? (Find some examples on the internet and discuss them with your students.)

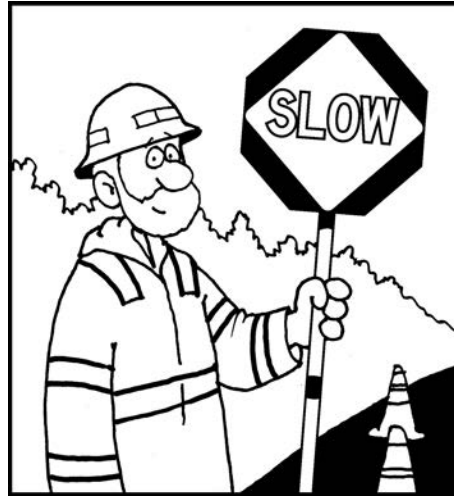
Slow down in work zones!

It's always a good idea to slow down and pay attention in work zones. In this work zone, two of the flaggers are exactly alike. Can you spot which ones are the same?

A.



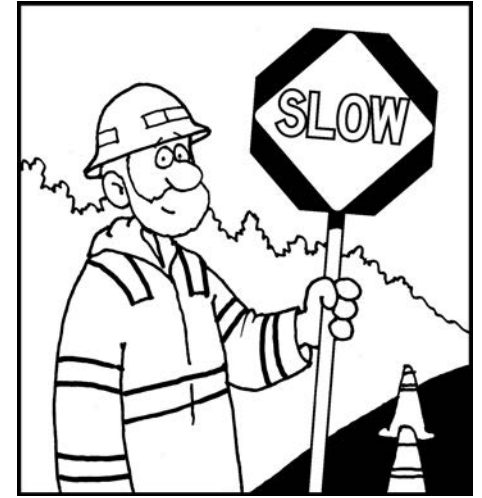
B.



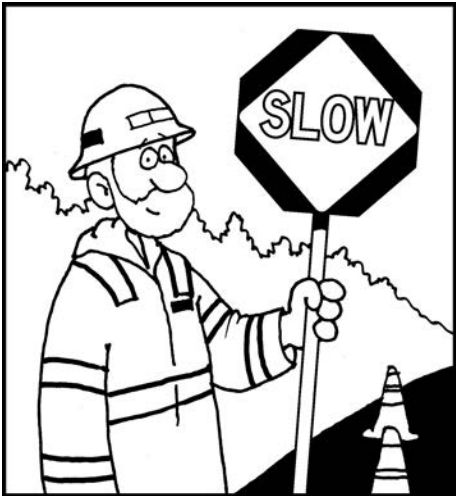
C.



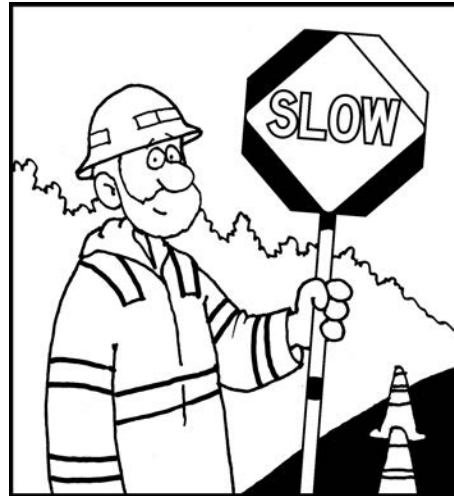
D.



E.



F.



G.



H.



Scrambled signs

Using the paths, transfer the letters to the blank boxes to unscramble the words. Uncover the secret safety message all drivers should know!

