

1 2020

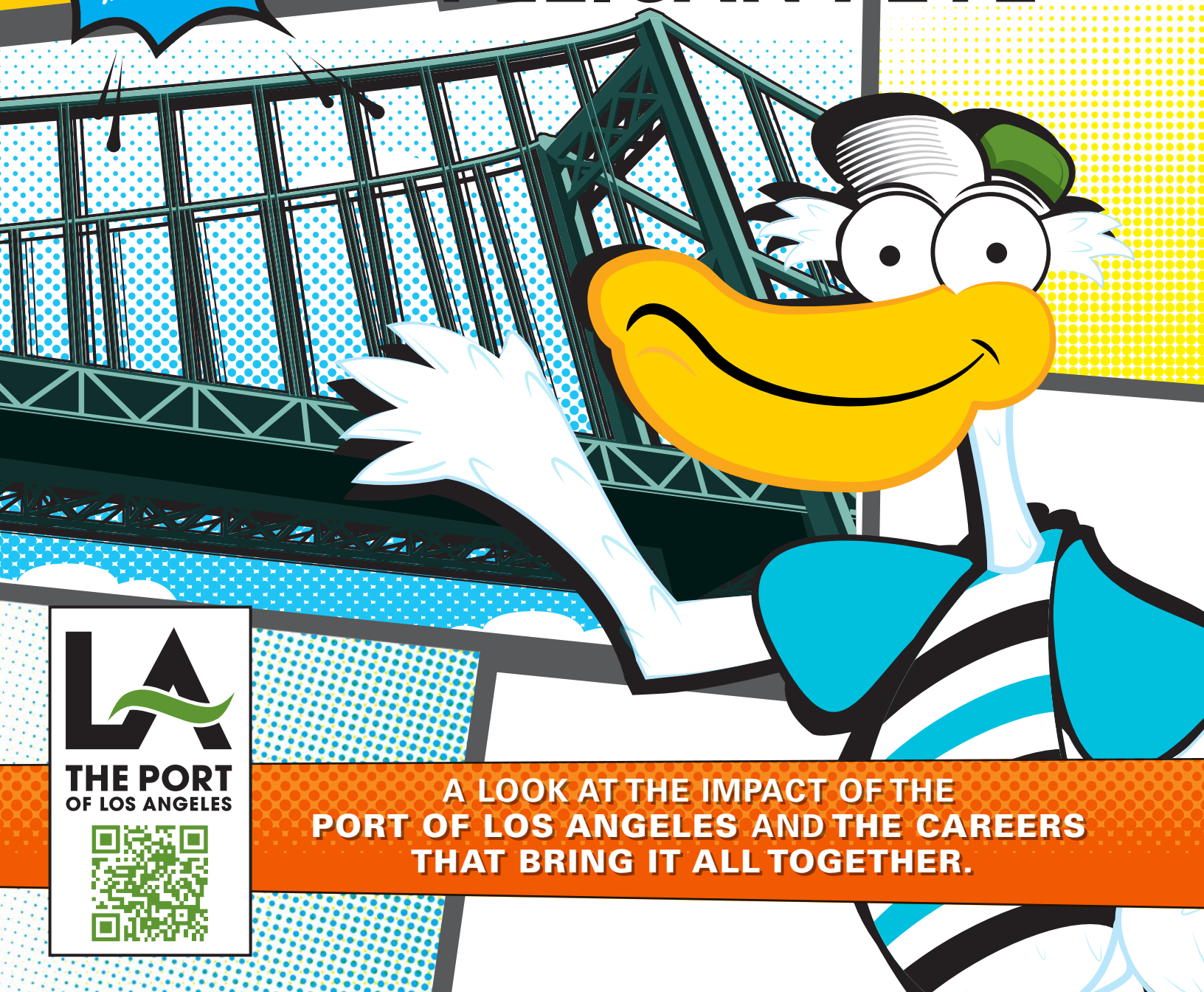
10 INFORMATIVE PAGES

S.T.E.M.

WITH

PELICAN PETE

SCIENCE
TECHNOLOGY
ENGINEERING
MATHEMATICS



THE PORT
OF LOS ANGELES



A LOOK AT THE IMPACT OF THE
PORT OF LOS ANGELES AND THE CAREERS
THAT BRING IT ALL TOGETHER.

SCIENCE

Explore STEM careers at the Port of Los Angeles, America's Port. Behind the scenes of this bustling operation are STEM careers making it all happen - Science, Technology, Engineering and Mathematics all are used in a variety of ways, every day to accomplish routine and amazing feats. Let's start with Science at the Port of Los Angeles and then examine Technology, Engineering and Mathematics. Jobs that use science include : Environmental Scientist, Test Lab Technicians, Gardeners and many others.

Port Science Careers



Test Lab Technicians

Collecting, identifying and testing samples is one responsibility of lab technicians at the Port. At our test lab, technicians routinely test the density/strength of cement which we use for our terminals, roadways and sidewalks. To ensure those surfaces can withstand repetitive use under extreme weight and vehicles, requires placing cement samples in a special oven and blowing the samples up.



Environmental Scientist/Specialist

Use their knowledge to protect the environment in and around the port. One unique responsibility is protecting the endangered Least Terns. Our team of experts are highly trained to manage and observe these tiny birds without disturbing them during nesting season to perform nest counts and keep a look out for predators who may harm the birds.



Professional Gardening

Gardening is a science as well as an art. The science aspect of gardening includes using the proper technique to help plants adapt in an area that is different than that of their native habitat/environment. Throughout the Port special care is used to maintain the unique variety of plants and trees that have been planted along the Promenade, park spaces, and bike trails to be admired.



Professional Painter

Painters at the Port are responsible for more than just applying paint. They must be knowledgeable about the types of surfaces, functions, and purpose of the job. They consult with and using the correct paint options, advising clients on color options, and preparing the surface for painting. They are also responsible for cleaning up the area and any paint spills that may have occurred.



Mixing Oil and Water

Some things just don't get along well with each other. Take oil and water as an example, you can mix them together and shake as hard as you like but they'll never become friends.... or will they? Take this fun experiment a step further and find out how bringing oil and water together can help you do your dishes.

What's happening?

While water often mixes with other liquids to form solutions, oil and water does not mix. Water molecules are strongly attracted to each other, this is the same for oil, because they are more attracted to their own molecules they just don't mix together. They separate and the oil floats above the water because it has a lower density.

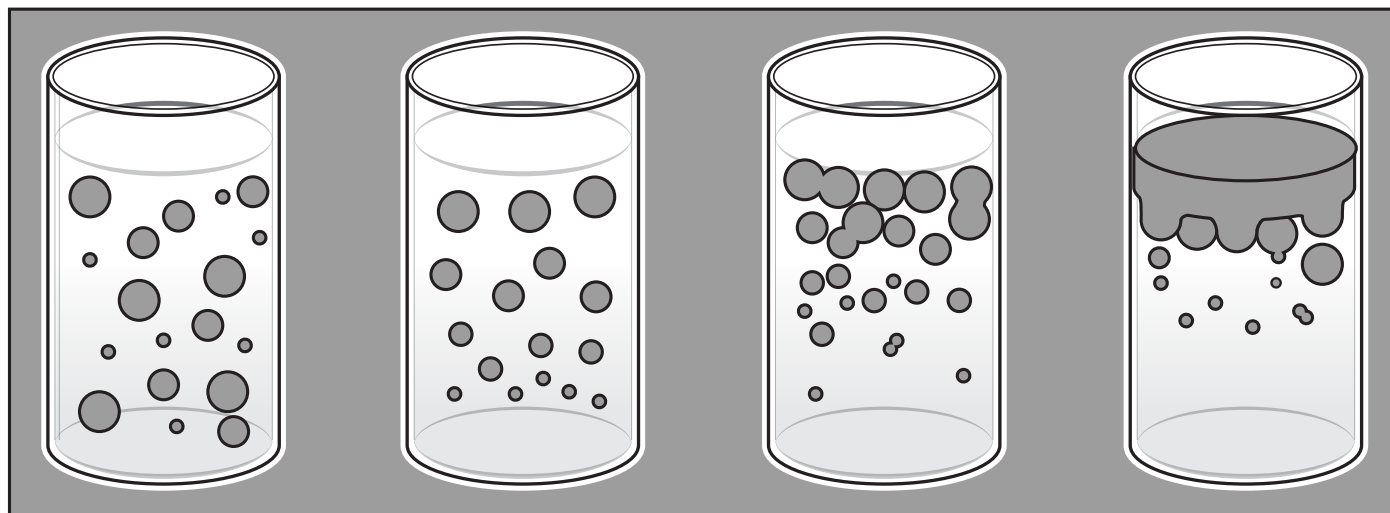
If you really think oil and water belong together then try adding some dish washing liquid or detergent. Detergent is attracted to both water and oil helping them all join together and form something called an emulsion. This is extra handy when washing those greasy dishes, because the detergent takes the oil and grime off the plates and into the water, yay!

What you'll need:

- Baby food jar with a lid
- Water
- Food coloring
- 2 tablespoons of oil (such as cooking, olive oil, etc.)
- Dish washing liquid or detergent

Instructions:

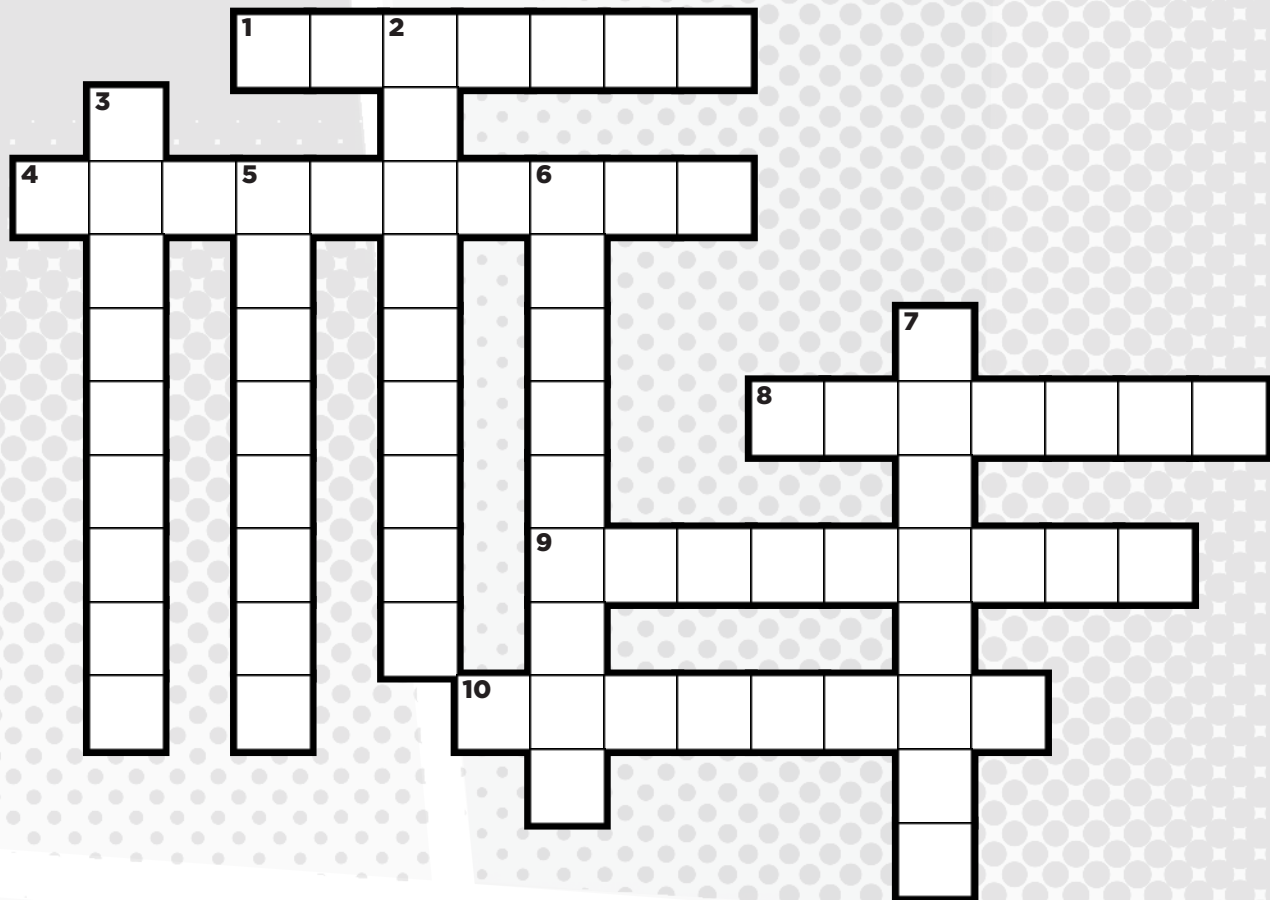
1. Add a few drops of food colouring to the water.
2. Pour about 2 tablespoons of the coloured water along with the 2 tablespoons of cooking oil into the small soft drink bottle.
3. Screw the lid on tight and shake the bottle as hard as you can.
4. Put the bottle back down and have a look, it may have seemed as though the liquids were mixing together but the oil will float back to the top.



Environmental Scientists and Specialists

Environmental scientists and specialists use their knowledge of the natural sciences to protect the environment, human health and wildlife. They may clean up polluted areas, test water samples, monitor air pollution, advise policymakers, or work with industry to reduce waste. On occasion, they have provided aid to an injured animal and ensured they were taken to an appropriate animal care facility. At the Port of Los Angeles, our goal is to facilitate global trade while protecting the environment. Our committed team of environmentalist work 24/7 to achieve this goal. We are very proud of the cleanliness of our harbor waters.

ENVIRONMENTAL CROSSWORD



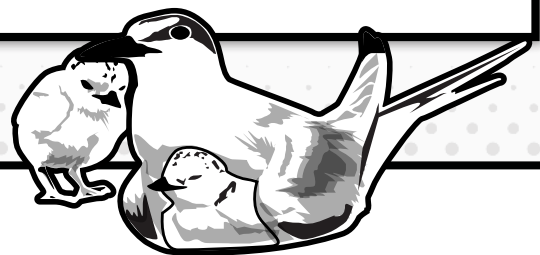
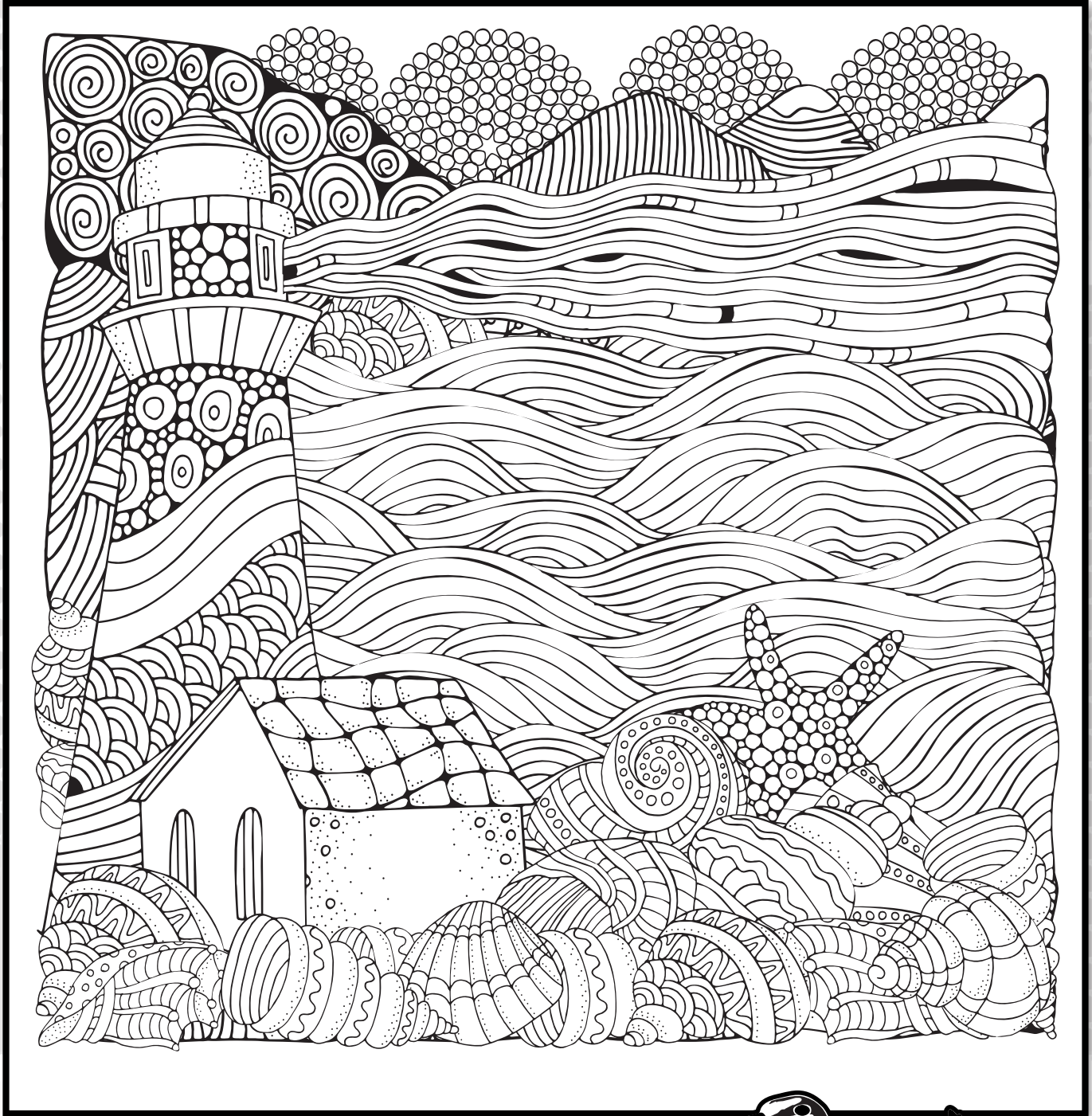
ACROSS

- 1 Place or environment where a plant or animal naturally lives and grows
- 4 Underwater towers of algae that provide food and shelter for marine life
- 8 Class of individuals having common attributes and designated by a common name
- 9 The line where a body of water and the shore meet
- 10 Material deposited by water, wind, or glaciers

DOWN

- 2 Expert in the branch of science concerning living organisms
- 3 Sternula Antillarum or also known as "Little Striker"
- 5 Small and microscopic organisms drifting or floating in the sea or fresh water
- 6 The complex of a community of organisms and its environment functioning as an ecological unit
- 7 Land or areas that are covered with shallow water or soil saturated with moisture

COLOR YOUR PORT



Protecting the Local Environment

Environmentalists work 24/7 to achieve this goal.

Protecting the Endangered Least Tern (*Sterna Antillarum*) - Our environmental team, who work in the area receive training on how to avoid disturbing the birds. During the nesting season nest counts are performed twice per week, other species are managed so they do not damage the tiny least tern eggs and chicks, predators are shooed away, and keen observers keep a look out for the types of fish the least terns are eating.

TECHNOLOGY

The Port of Los Angeles is America's premier gateway for international commerce. Our thriving seaport is recognized for record-setting cargo operations, environmental stewardship, community partnership, progressive security measures, historical landmarks, and the LA Waterfront. Behind the scenes of this bustling operation are STEM careers making it happen. The Port of Los Angeles is leading the way internationally to reduce air emissions, improve water quality, and cultivate new technologies that ensure good jobs and a brighter future.

BUILD A COMPASS

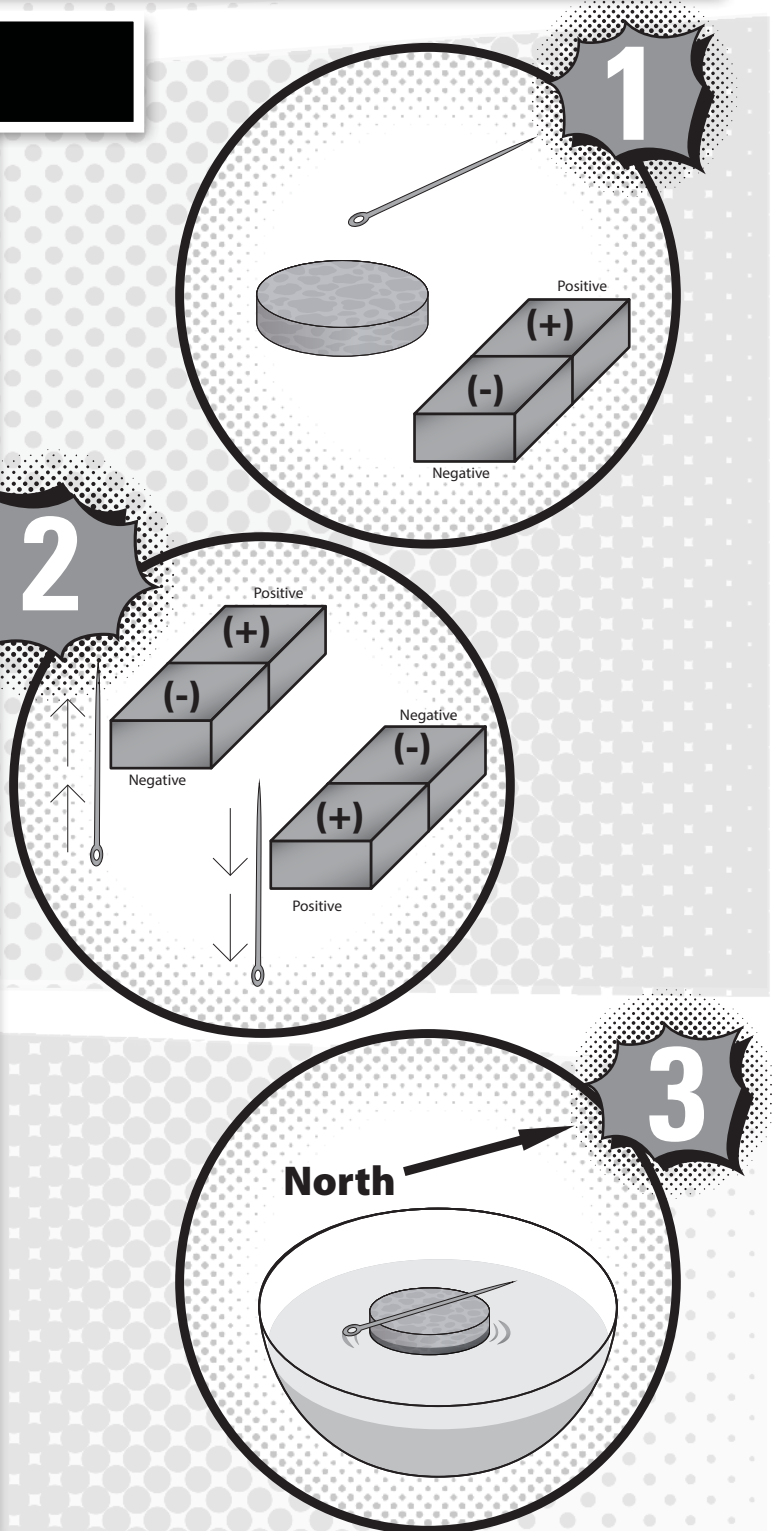
Materials Needed:

- Sewing Needle
- Magnet (You can magnetize your needle using a variety of methods: rubbing it with a magnet, or rubbing it on another item that magnetizes it with static electricity.)
- Coin-sized cross section of cork
- A bowl of water

Your Challenge:

BUILD A COMPASS

1. Rub one end of the needle on one side of the magnet 30 times (the north pole if your magnet is labeled). Always rub in the same direction.
2. Flip the magnet over and rub the other end of the needle on this other side 30 times. Again, rub in the same direction.
3. Center needle on cork.
4. Place the cork and needle on the surface of the water. Both ends of the needle should extend beyond the cork's edge and above the water.
5. Watch it slowly rotate and then stop.
6. Check the directions with a compass. One end of the needle (the one that you rubbed on the north pole of the magnet) should point to north and the other south.



TECHNOLOGY WORD SCRAMBLE

Unscramble the words below to unveil some of the technological careers and equipment at the Port.

Cuomertp _____

Hint: You can use this to access Google Classroom. It's an electronic device for storing and processing data.

Wbe sidengre _____

Hint: A person who creates/produces and maintain websites.

grPonmrrmiag _____

Hint: Writes code while others are tasked with troubleshooting existing script.

aTicencl tpruosp _____

Hint: Provides assistance to users of technology products such as mobile phones, televisions, computers, software products or other electronic or mechanical goods.

erbCy uctseiry _____

Hint: Protects networks, devices, programs, and data from attack, damage, or unauthorized access.

smteSys niianstormaitd _____

Hint: Responsible for the upkeep, configuration, and reliable operation of computer systems.

Snaor _____

Hint: A system for the detection of objects under water and for measuring the water's depth by emitting sound pulses and detecting or measuring their return after being reflected.

taDa ogatsre _____

Hint: It is a way of keeping information in the memory storage for use by a computer.

aRadr _____

Hint: A system for detecting the presence, direction, distance, and speed of ships, and other objects, by sending out pulses of high-frequency electromagnetic waves.

ileTanrm nomuitoata _____

Hint: Located on the TRAPAC Terminal this technology features automatic stacking cranes and fully automated straddle carriers.

SGP ioatgiavnn _____

Hint: is a 24-satellite navigation system that uses multiple satellite signals to find a receiver's position on earth.

ENGINEERING

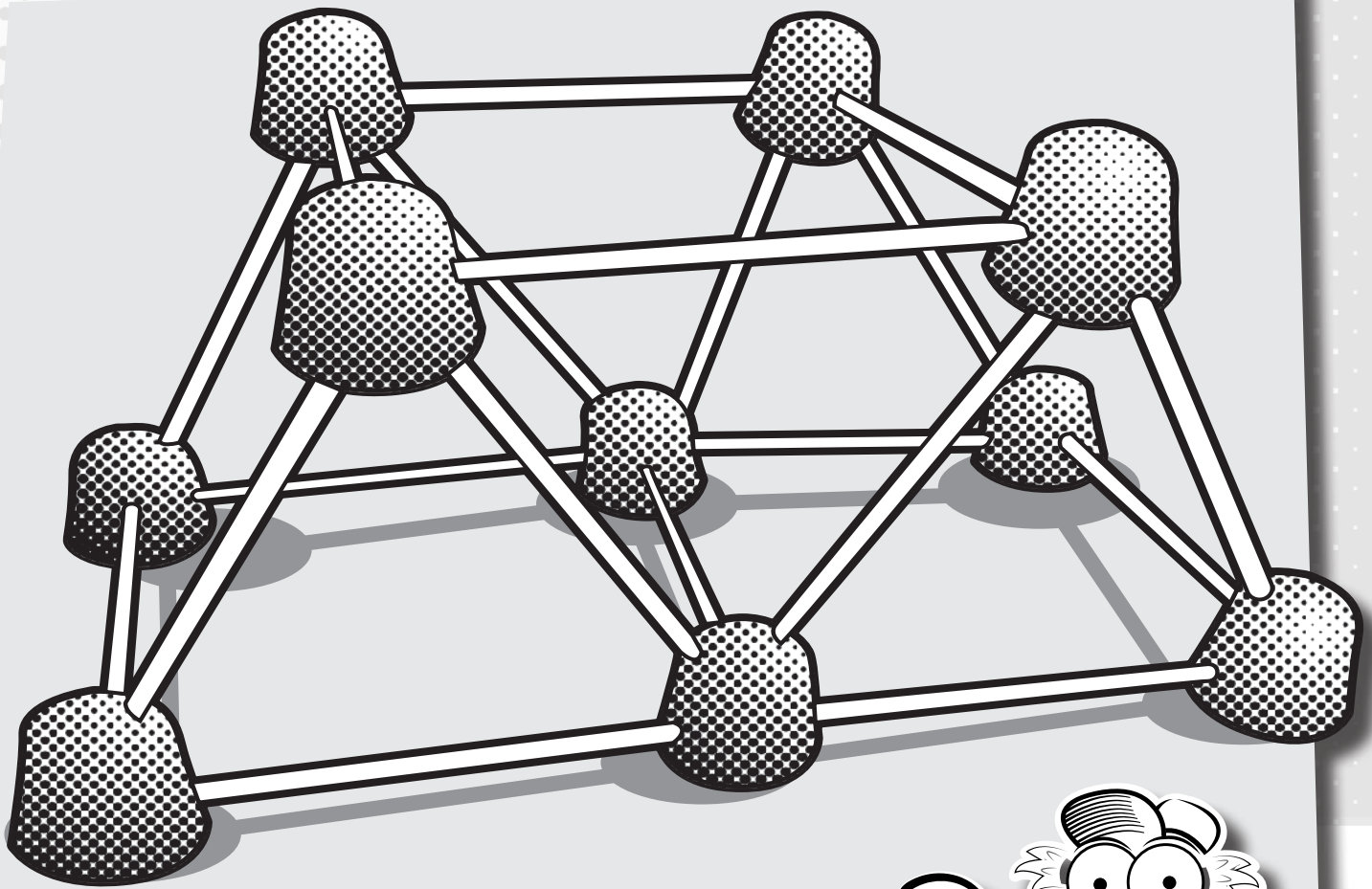
GUM DROP BRIDGE

Materials Needed:

- 10 Gum Drops
- 20 Toothpicks

Your Challenge:

Using only 10 gumdrops and 20 toothpicks, design a structure that can hold the weight of a large textbook.



STEM Connections

Science & Math = Physics & Shape Comparison

Engineering & Technology = Load Distribution & Building Structures

MATCH GAME

Today, the field of Engineering uses science, technology and math to solve problems. Engineering is incorporated nearly everywhere along the LA Waterfront in the creation of parks, promenades, terminals, roadways and more.

Match the Engineering title to its job description.

a. Robotics Engineers

1. designs things like roads, building bridges

b. Chemical Engineers

2. designs outdoor spaces- parks, promenades

c. Civil Engineers

3. measure land and air space

d. Electrical Engineers

4. test the strength and flexibility of concrete under stress

e. Surveyors

5. often works in a laboratory and applies the principles of chemistry and other sciences to solve problems

f. Landscape Architects

6. behind- the -scenes designer responsible for creating robots and robotic systems

g. Materials Technicians

7. install and maintain the wires that bring us electrical power

An engineer uses science, technology, and math to solve problems.

At the Port of Los Angeles, we can see engineering everywhere along the waterfront. In the creation of the terminals, roadways, landscaping and more.

- **Robotics Engineers** is a behind-the-scenes designer, who is responsible for creating robots and robotic systems that are able to perform duties that humans are either unable or prefer not to complete.
- **Chemical Engineers** often work in a laboratory and apply the principles of chemistry and other sciences to solve problems.
- **Civil Engineers** design things like roads, ports, airports buildings bridges to name a few.
- **Electrical Engineers** install the wires that carry and bring us electricity. They also fix electric machines.
- **Surveyors** measure land and air space.
- **Landscape Architects** designs outdoor spaces – parks recreation, green belts.
- **Materials Technician** test a material's strength and flexibility under stress such as concrete. In order to test its strength our technicians blow it up in a special oven.

MATHEMATICS

Mathematics is the science that deals with the logic of shape, quantity and arrangement. Math is very important because it is all around us and in everything we do, even at the Port of Los Angeles.

Jobs at the port that are math related include Economist, Statisticians, Accountants, Auditors, Wharfingers, Engineers, and Architects to name a few.

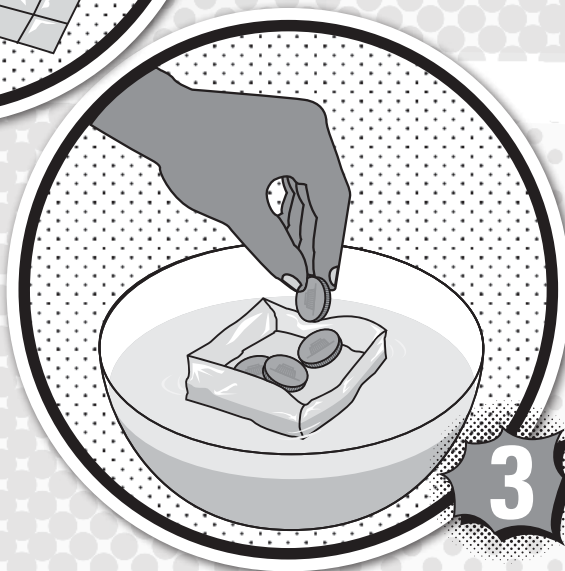
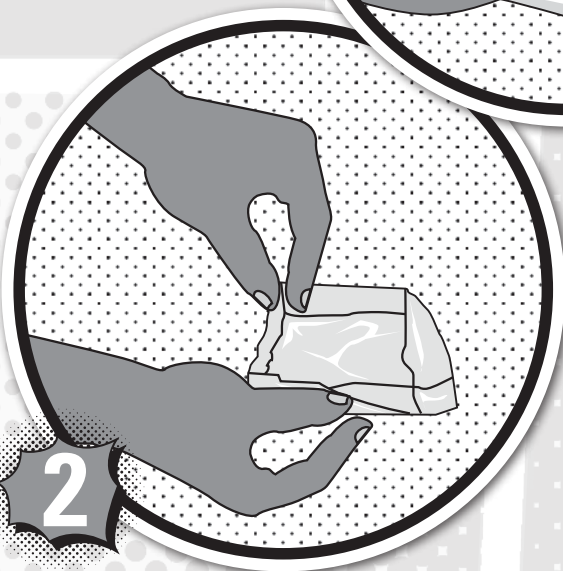
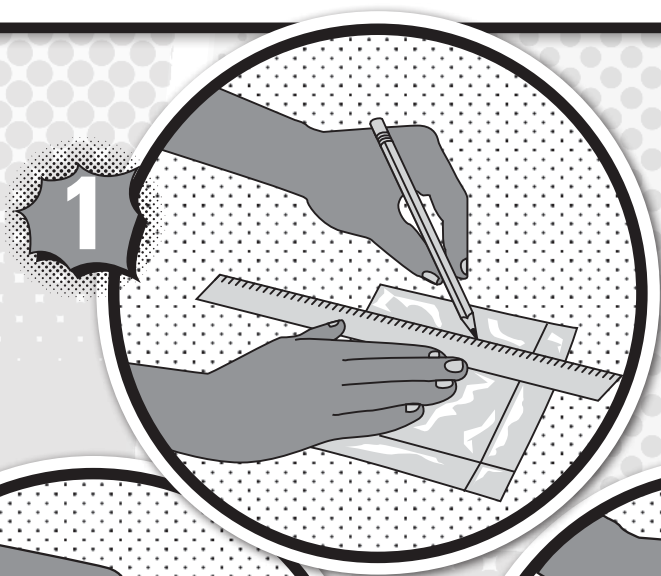
PENNY FOIL BOAT

Materials Needed:

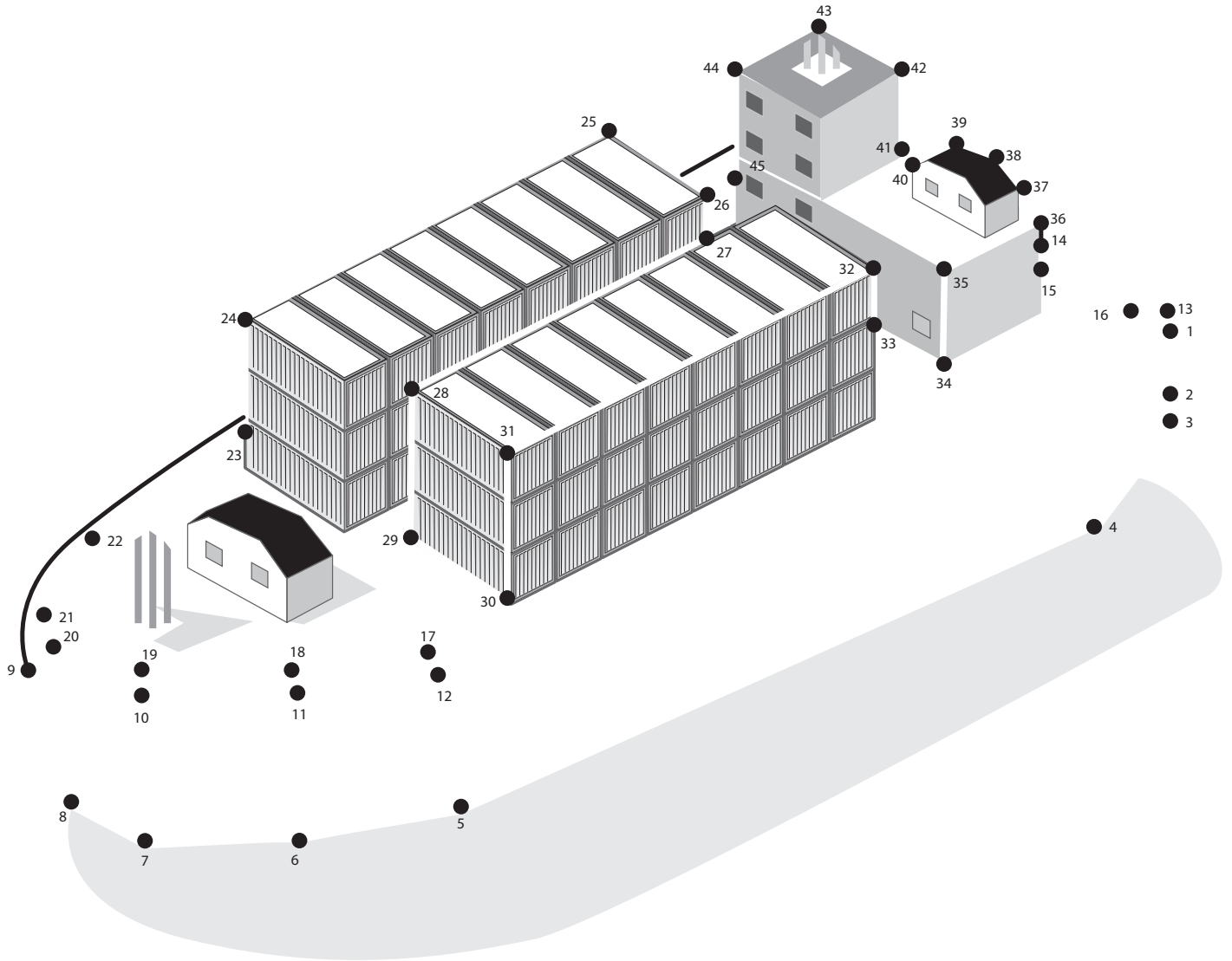
- Aluminum foil Squares - 5 x 5 Inches
- Water
- Approx. 50 Pennies
- A fish tank/large bowl for setting these in when filling with pennies

Your Challenge:

The goal is to build and modify a boat to hold as many pennies possible. Let's see how many pennies it can hold before it sinks.



CONNECT THE DOTS



STEM CAREERS

R J T M N P H U U G O W U B J E U D D V
 K S C I H P A R G Z U K Q R W R Q H Q I
 Q J U D Y C Y T J N Q E O R Z I I D M E
 C O N S T R U C T I O N N M O R Z X C Q
 U U H B T E S T L A B B K P E T S U J W
 S M U M V H L C Z W B I E E F U I I S G
 I Q J Y K E I F M P V E N J F B C D R V
 O N D L T Q V M Z S V I E X Q N Q W U V
 H E G A N U I F S K G A E Z V J J A K A
 L P S C A G C I A N I A T P A C T A O B
 F A K I T Q S E E J J O O H E B S X A X
 F C H N N T R L X S R B S N R L T T B O
 V S N A U G C D B N M L D F O V R O N T
 J D U H O X L E R Y J X F A T U U L X S
 W N P C C F H R T T C E A E C R C I N Q
 V A S E C M I L W I C J H U E H T P Q R
 N L R M A L K J I A H P P S P I U T S W
 J L A C I R T C E L E C X N S W R R N J
 P Z R A W T J E O R V F R E N M A O R P
 W Z R O Y E V R U S Q L P A I I L P U H

CONSTRUCTION
 BOAT CAPTAIN
 SURVEYOR
 MECHANICAL
 AUDITOR

ACCOUNTANT
 ELECTRICAL
 STRUCTURAL
 LANDSCAPE

FIELD
 ENGINEER
 TEST LAB
 GRAPHICS

CIVIL
 INSPECTOR
 ARCHITECT
 PORT PILOT



Port of Los Angeles, 425 S. Palos Verdes Street, P.O. Box 151, San Pedro, California 90733-0151
 Tel/TDD: (310) SEA-PORT • www.portoflosangeles.org

An Affirmative Action/Equal Opportunity Employer. As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services, and activities.