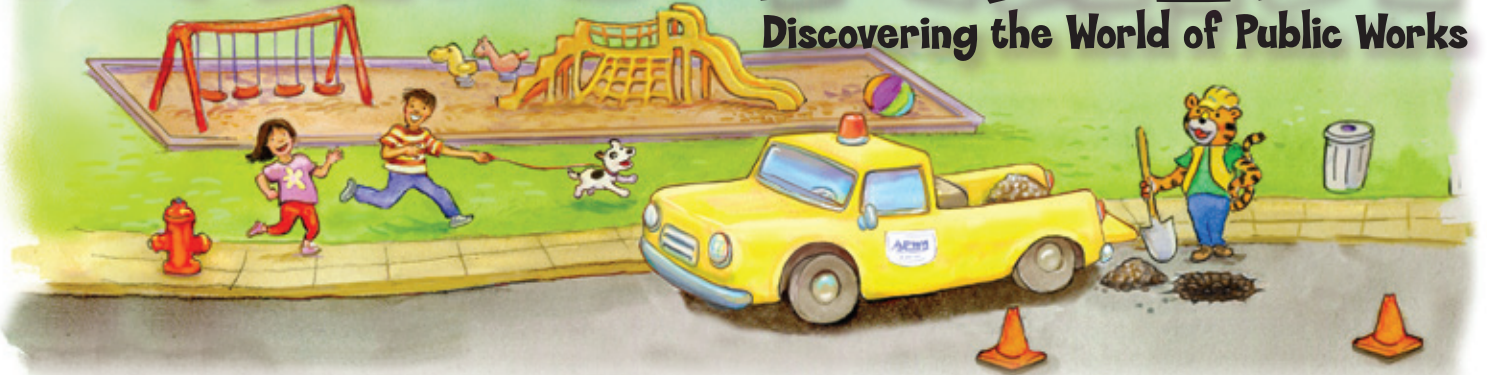


# PAWS PRINT

Discovering the World of Public Works



## CELEBRATING PUBLIC WORKS



### Public Works Works for You!

You might ask "What is public works?" Public works is services provided to the public, used by the public, and usually paid for by their tax dollars.



Public works can be found all around you. It is transportation (how people travel), construction (how public facilities are built), water and wastewater (how water is cleaned and goes through pipes), and more. You might have seen or used public works projects without knowing who did the work.




Remember, it's because of public works that your community is a better, safer place to live, work, and play. Look at these pictures—are any of these services familiar to you? 🐾





## What is National Public Works Week?

Are you ready for National Public Works Week? We are! In fact, we are so excited, we want you to celebrate with us.

National Public Works Week (NPWW) began in 1960. It is celebrated the third full week of May, which this year is May 21–27, 2017, in cities all over North America! What is it that we celebrate? The men and women of public works, of course! NPWW is when we think of all of the great things that the people of public works do. Why do they do them? To make your community a better place to live, work, and play. 




*This year's National Public Works Week poster was created by Dan Cosgrove. This year's theme "Public Works Connects Us" celebrates the vital role public works plays in connecting us all together.*

## 10 Ways to Celebrate National Public Works Week

- 1 Ask a teacher or parent to arrange a tour of a public works facility
- 2 Plant a tree (or two or more!)
- 3 Learn about public works projects from around the world (get started on page 3)
- 4 Pick up some litter around your school or in a public park
- 5 Simply enjoy a public park or playground
- 6 If you haven't already, begin recycling!
- 7 Build a model of a famous bridge (see page 4)
- 8 Make a list of all the things public works does for you and your family
- 9 Draw a picture of a public works snow removal machine (see page 5)
- 10 Thank a public works employee for his or her hard work! 

## Fly Your Flag!

Every country has its own flag. Even every state in the United States has its own flag! Can you draw your country's flag? Or your state's flag? Or better yet, why not design your own original flag? 

Whether you chose to draw your country's, state's, or original flag, explain what each part of your flag stands for:

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# Meet P.W. Paws and Chipper!

P.W. Paws is the official mascot of the American Public Works Association! His favorite color is safety green (of course), and you can find him working for public works all over the place. You might even spot him as his favorite superhero character—ready to take on the bad guys!

P.W. Paws knows just how public works makes communities healthier and safer places to live, work, and play! He loves telling people all about it—especially students. You never know when he might visit your school!

Chipper lives with the Keystone family and Mr. Keystone is a Public Works Director. Chipper has learned a lot about public works just by being the family dog! His favorite people are his young owners, Ben and Madison. He loves to play, have a snack, go for walks, have a snack, take naps, and...have a snack.

For such a young pup, Chipper is smart, brave, and helpful to others. He is all those things and more during his many adventures through the world of public works!



## Word Play!

Draw a line connecting the words to form four complete sentences!

Dogs	climbing	up	really	high
The	drove	from	was	ramps
Those	drink	go	many	fountain
We	swings	wall	the	tall





## Bridges Around the World!

Public works plays a major role in building, repairing, and maintaining bridges. That way you and your family can get safely to work and school. Check out these cool bridges from around the world!

### The Golden Gate Bridge — San Francisco, California

Completed in 1937, it was the longest suspension bridge in the world at the time. It's 4,199 feet long and is one of the biggest tourist attractions in the city. It was painted bright red-orange to make it more visible through the thick fog. Of course, its upkeep requires a mere 5,000 – 10,000 gallons of fresh paint per year.

Suspension Bridge — a bridge where the main deck is supported by vertical cables suspended by larger cables running between tall towers.



### Ponte Vecchio — Florence, Italy

Its name translates into "old bridge" and they aren't kidding. This stone arch bridge was built in medieval times and is the only bridge in Florence to survive World War II. The bridge crosses the Arno River and is still lined with many small shops—a common practice back in the times when it was built.

Stone Arch Bridge — The weight of the deck is supported by stone arches from below. An arch is one of the strongest shapes in architecture.



*continued on page 5*



## Tower Bridge — London, England

Tower Bridge is a combination suspension and bascule bridge. It crosses the River Thames and is near the famous Tower of London, which is where it gets its name. But the bridge has two towers of its own! They are connected by two high, sturdy walkways—strong enough to support its suspension cables. Its construction began in 1886 and it took eight years to build.

Bascule Bridge – a bridge where sections can be raised so tall ships can pass through.



## Millau Viaduct — Millau, France

The Millau Viaduct is the tallest vehicular bridge in the world and spans the valley of the River Tarn. It was opened in 2004 and has seven piers of different heights. It is 1,125 feet tall—taller than the Eiffel Tower! It carries four lanes of traffic but the speed limit had to be reduced after it first opened. People were slowing down anyway to admire the beautiful view.

Viaduct — a bridge-like structure carrying a road or railroad across a valley or other low ground.



## Akashi-Kaikyo Bridge — Japan

Also known as the Pearl Bridge, the Akashi-Kaikyo Bridge is now the longest suspension bridge in the world. At 6,532 feet long, it crosses the Akashi Strait and connects the mainland to the Awayi Island. It took 12 years to build and was finally opened for traffic in 1998. However, the bridge was originally only supposed to be 6,529 feet long (still not too shabby). An earthquake in 1995 was so strong, it moved two of the tall towers! Before the bridge was completed, it had to be extended by a little more than 3 feet. 🐾



## What's New with Kayla's Krew!

Do you think someone in a wheelchair could ever play on a swing set? If you said no, then you've never been to Kayla's Playground in Franklin, Wisconsin!



Kayla Runte was a special little girl with cerebral palsy who touched many lives. After she passed away, her mother, Shelly Runte, helped form Kayla's Krew—a team that built a one-of-a-kind, all-accessible, all-inclusive playground in Kayla's name!

all-accessible, all-inclusive – open to any kind of person (old, young, in a wheelchair, on crutches, etc.)



Glen Morrow, the Franklin Public Works Director/City Engineer, worked with Kayla's mother and city staff members to find the best location for the playground. They finally landed in the beautiful setting of the Franklin Woods Nature Center.

With community support and the help of over 1,500 volunteers, the 12,000-square-foot playground was built in just nine days. It opened for play on October 9, 2015.

Per Kaylascrew.org: "Kayla never walked or spoke a word, but she had friends who encouraged her and in return taught valuable life lessons of compassion, patience, and acceptance."



Kayla's Playground is the perfect example of the APWA Diversity Committee's mission. This new park values different kinds of people with different needs and viewpoints. That way everyone can be included! 🐾

### Some of the cool things you'll find at Kayla's Playground:

- Fully accessible ramps to activities
- Fully accessible merry-go-round with spaces for two children in wheelchairs
- Fully accessible "Liberty Swing" for children in wheelchairs
- Two "expression swings" for a parent and child to swing together
- Kid's city hall for two- to five-year-olds: a library, police station, and firehouse
- Accessible rocking boat deck
- Climbing wall and trees
- "Little Free Library"—a take one, leave one library stocked with children's books
- Pavilion with area for gas grilling
- Pet water fountain
- And so much more!





## Let it Snow!

The people in public works not only work hard to keep your roads safe during summer, they really work up a sweat in the cold, cold winter! Depending on where you live, you might get a lot of snow or no snow at all. But if you do see many snowstorms, chances are your local public works has a lot of big equipment to get the job done. Below are some big machines to take care of big snow!



**Brine Truck** – At the first sign of a winter storm, these trucks hit the streets to “pre-wet” the road surface. This helps keep ice from forming. They can use a salt brine solution, calcium chloride, or even sugar beet juice (or a blend of all three).



**Salt Truck** – These big dump trucks carry salt and have a special device that spreads the salt behind them as they go. Salt helps melt the ice to make the roads safer.

*continued on page 8*



**Loader** – These powerful tractors load salt into the backs of salt trucks.



**Snowplow** – This vehicle has a large blade that pushes snow off the street and up to the curb. It can be a tractor with a blade, a pickup truck, or even a salt truck with its own blade.



**Sidewalk Plow** – A smaller-bladed tractor that clears snow from sidewalks around public buildings and public parking lots.



**Blower** – This machine churns up the snow and then blows it off to the side. To clear a large area, like a public parking lot, these machines can even blow snow into the back of a large truck to be hauled away.

## Important Winter Safety Tips:

- Stay clear of public works vehicles as they work
- Even if the snow has been cleared, be careful walking on cement sidewalks and crosswalks
- Be a good neighbor and shovel sidewalks in front of your home
- Don't shovel or blow snow into the street
- Try to clear snow away from fire hydrants near your property
- Don't build a snow fort on or near the packed snow left by a snowplow





# A man, a plan, a canal, Panama!

The phrase above is a famous palindrome about the Panama Canal – one of the largest public works projects in the world!

Palindrome ('palən-drōm) — a word or phrase that can be read the same backward and forward. It can be a name: Bob, a word: racecar, or a sentence: Was it a car or a cat I saw?

Before the creation of the Panama Canal, if a ship were to sail from the Atlantic Ocean to the Pacific Ocean, the shortest distance (which wasn't short at all) was all the way around the southernmost tip of South America. There had to be something better. Maybe someone could dig a long, wide trench from one ocean to the other? Some kind of river? Some kind of ... canal?

Although many nations wanted to build a canal for centuries (even Thomas Jefferson tried), the United States finally began official construction on the Panama Canal in 1903 in the new nation of ... you guessed it—Panama!

This was no simple project. Temperatures in Panama were often over 100°. Other than construction accidents, workers were plagued with malaria and yellow fever, until the disease-carrying mosquitos could be eliminated.

There was also the fact that the Pacific and Atlantic Oceans were at different levels. So three large locks had to be created. Locks are closed-off sections of the canal so water can be added, raising the water level to match the level in the next lock.

Eleven years later, the Panama Canal was finally finished and first used on August 15, 1914. Now, a trip through the canal takes about 8 to 10 hours instead of the two weeks it takes to travel around South America. Around 14,000 vessels pass through the canal each year, averaging 40 per day.

But that's not all! In 2007, construction began to expand the Panama Canal even further. Today it has three new locks, double the capacity, and even allows larger ships to sail through. Of course, this only cost an extra \$5 billion! 🐾



*continued on page 10*



## A man, a plan, a canal, Panama! (continued)

### Building The Canal

- Length: 48 miles
- Cost: more than \$350 million
- Human Cost: 5,600 workers were reported killed between 1904 and 1913
- Workforce: At times more than 40,000 workers
- Supplies: 3.4 million cubic meters of concrete went into building the locks
- Machinery: more than 100 steam shovels were used
- Removal: more than 240 million cubic yards of rock and dirt were excavated

### Running the Canal

- Average Toll Per Ship: \$150,000
- Most Expensive Toll: \$829,000 – paid by a large cargo ship in 2016
- Cheapest Toll: 36 cents – paid by Richard Halliburton in 1928, when he swam through
- Yearly Income: around \$2 billion per year

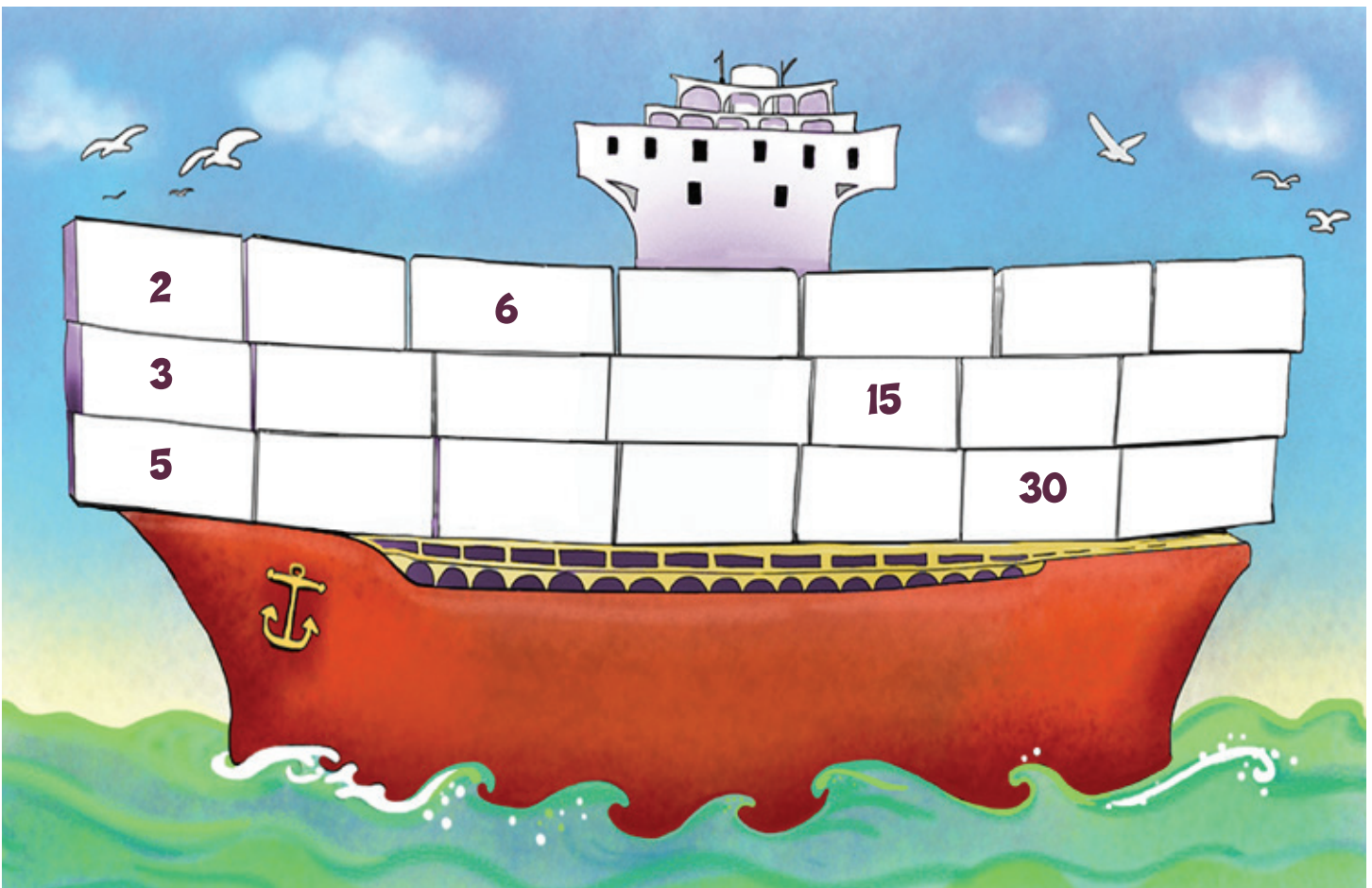
## Search the Article to Answer These Trickier Puzzles

(see pages 7 and 8)

1. It's 1928. You and nine of your friends want to swim through the Panama Canal. How much will it cost?
2. You're on a boat, floating through the Panama Canal. So far, you've only sailed 12 miles. How many more miles do you have left until you're at the other end?
3. You have \$125 million and you want to build your own canal. How much more money will you need?
4. How many days would it take 360 ships to pass through the Panama Canal?
5. How many ships would pass through the canal in two years?

## Hold That Lock!

These cargo containers lost their labels! Number the rest of the containers by counting by 2's, 3's, and 5's.





# Public Works Eyes in the Skies

Many public works employees across the country have begun using Unmanned Aerial Vehicles (UAV, also commonly known as “drones”) to help with the daily workload. UAVs (“drones”) may be fun, new toys for some of you—but they’re also cool, new tools in the public works toolbox!

## UAV – Unmanned Aerial Vehicle

UAVs (“drones”) are being used to inspect bridges for storm damage or maintenance issues. They’re used to check out flood control systems—constructed channels, inlets, outlets, and rivers. They can even check on traffic flow issues. Their tiny cameras record what they see from up high and send the video back down to the operator in real time.

Because they can cover a large area more quickly, drones can also assist in rescue operations. They can help with locating survivors after a storm or help find lost hikers in the woods.

As UAVs become more advanced, they can be preprogrammed to fly in a grid pattern, photographing a large area before automatically returning to the operator. Using special software, those photographs can be turned into a 3D image of a potential construction site or project already underway.

UAVs can be much more than an eye in the sky. In Florida, ROVs (Remote Operated underwater Vehicles) are used. These ROVs are small submarine units that help inspect water management systems. One ROV can keep several scuba divers out of alligator-infested waters!

So, if you get a toy drone for your birthday, have fun and get plenty of practice piloting it. You may be able to operate a big UAV (“drone”) someday in public works! 🐾



Public works employee operating a drone



Helicopter UAVs – can hover in one place and are more controllable



Fixed-wing UAVs – cover more distance and are able to fly in stronger winds



3D rendering of a drone-mapping project



Uh-oh! Chipper is lost again. Can you find the 12 hidden Chippers? 🐾



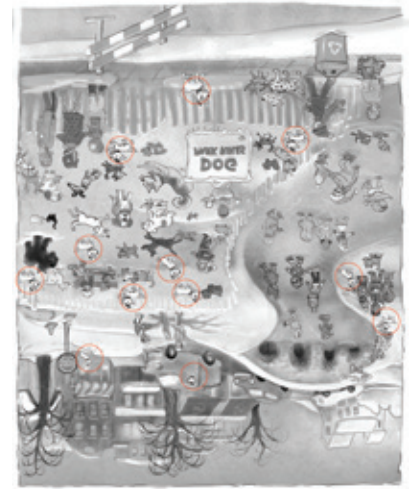
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The American Public Works Association (APWA), an international educational and professional association, is committed to advancing and promoting outreach and public awareness of public works for school-aged children in all communities.

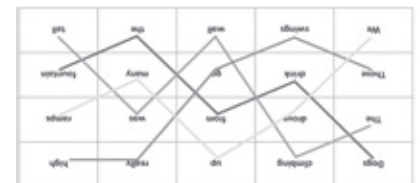
**ANSWER KEY:**



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1.  $36 \text{ cents} \times 10 = \$3.60$
2.  $48 - 12 = 36 \text{ miles}$
3.  $350 - 125 = \$225 \text{ million}$
4.  $360 \div 40 = 9 \text{ days}$
5.  $14,000 \times 2 = 28,000 \text{ ships}$

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