Wildland Fire
Junior Ranger Activity Book

National Park Service
U.S. Department of the Interior

Branch of Communication and Education
Division of Fire and Aviation

Name: _____

Age: _____

How to become a WILDLAND FIRE JUNIOR RANGER:

- ☐ **Ages 6-9: complete at least 6 pages in the booklet.**
- ☐ **Ages 10 and above: complete the entire booklet.**
- ☐ **Remember to respect natural and cultural places.**
- ☐ **Have fun and be safe with fire!**

Fire Ingredients

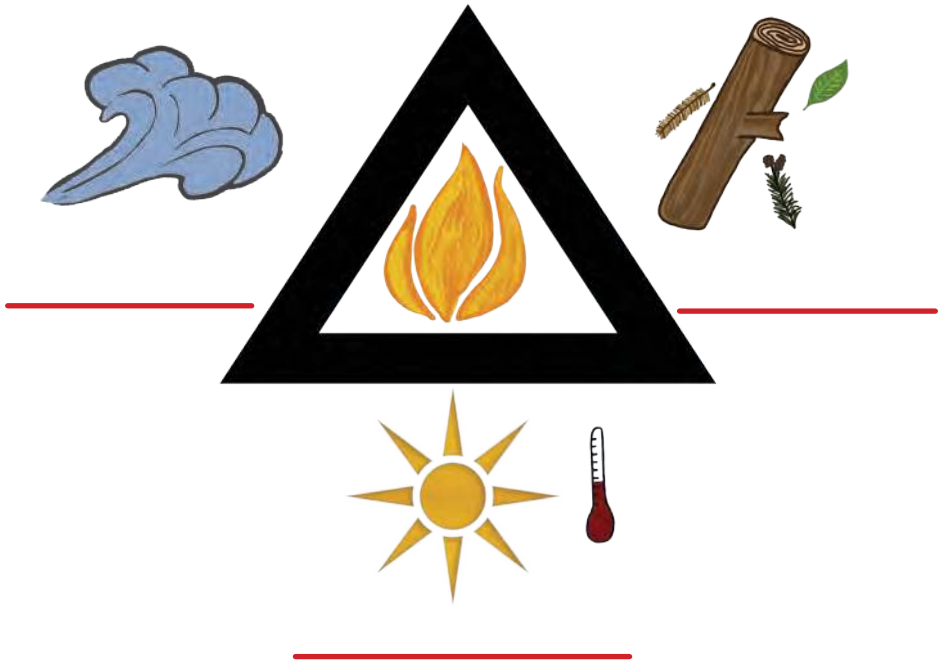
What is needed for fire to burn?

The three ingredients for fire:

- Fuel
- Heat
- Oxygen

All three ingredients are needed for a fire to burn and are known as the fire triangle.

Label each side of the fire triangle with the correct ingredient.

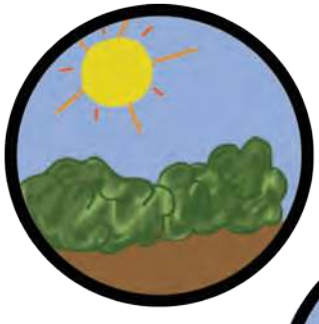


DID YOU KNOW?

Ladder fuels **are live or dead plants that allow the fire to climb to higher levels of shrub and trees.**

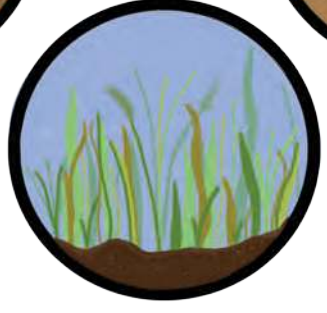
What is fuel?

Fuel is anything that can catch fire! The amount of moisture inside plants determines how easily it can burn. Fuel can be categorized by types of plants and where it is found on the landscape.



Brush/Shrub

Timber



Grass

Circle which types of fuel you see where you live.

(Hint: you may circle more than one)

Fire is a Natural Cycle

Fire is part of a natural process in our environment. Some plants and animals rely on regular fire events to live. In some landscapes, fire managers use prescribed fire to maintain healthy habitats.

In other locations, habitats take a long time to recover from wildfires. Across the western US, earlier snowmelt and higher temperatures have driven larger and hotter fires than those seen historically.

Climate scientists and fire scientists work together to measure the effects of climate change on wildfires and discover how we can help habitats recover.

DID YOU KNOW?

Charred wood makes excellent habitat for insects. Some bugs, like the white-spotted sawyer beetle, help regenerate the forest after it burns.

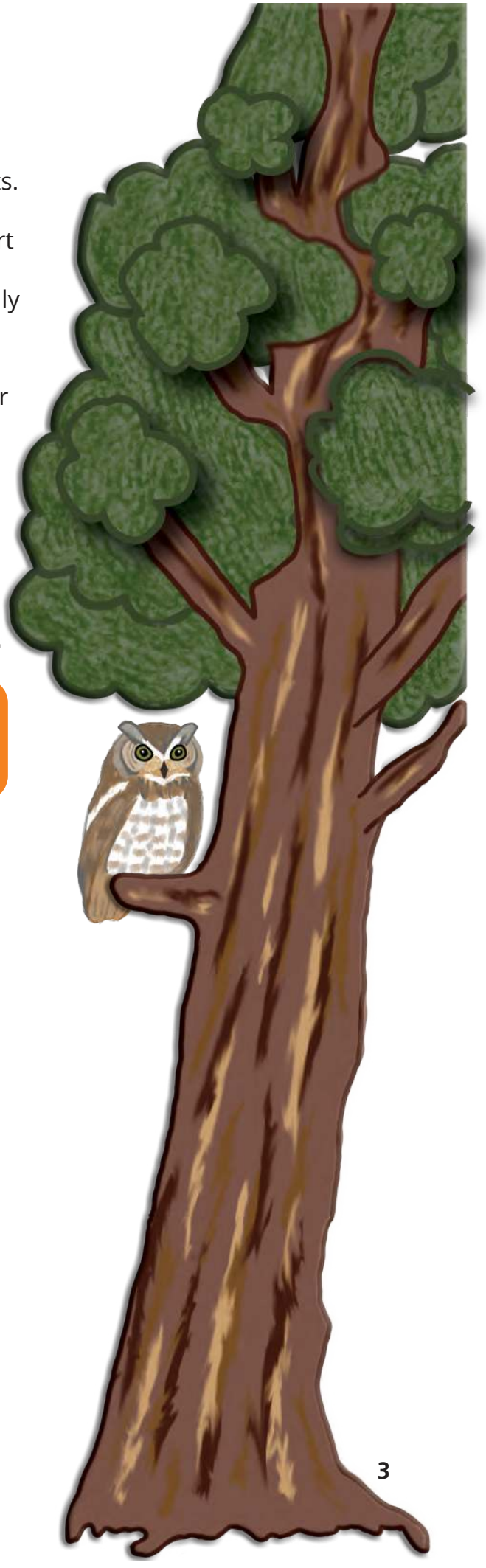
Plants and animals adapt to their environment and learn to live with fire.

Many plants have adapted to live in fire-prone environments. Some trees have thick bark to resist flame. Some plants depend on the heat from fire to release their seeds and start new life. Ash serves as a fertilizer, helping new growth. Fire removes old debris, exposing soil to the sun. Some trees only have high branches, out of reach of most flames.

Animals have natural instincts for when fire approaches their home. Large mammals can run away from fire. Smaller creatures find places to burrow and hide under rocks. Birds fly away from the flames.

How do you adapt to your environment?

Draw in the forest between the burned trees and the healthy tree to show plants as they start to regrow.



Safety First!

Wildland firefighters must wear special clothes and equipment to do their job, and do it safely.

Match the picture with the correct definition:

Device that allows firefighters to talk to one another

Made of leather, these protect firefighter's hands from flames

Protects the head from falling objects, like tree limbs

Protects firefighter eyes from debris and smoke

Made of aluminum, fiberglass, and woven silica, this item is used only in emergency

Made of leather, these provide foot protection

Made from fire resistant materials and allows firefighters to be more visible

Stores items firefighters may need, like water, maps, and a first aid kit

Line Pack

Hard Hat

Goggles

Gloves

Pants/Shirt

Radio

Fire Shelter

Boots

What items do you wear to protect yourself from the environment?

Tools of the Trade

Chainsaw

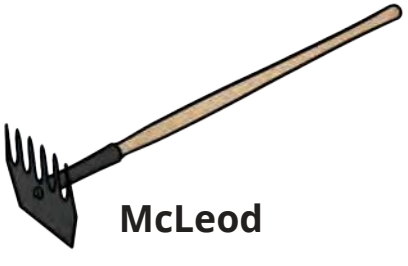
Used to cut dangerous and fallen trees into smaller logs for clearing

Pulaski

Has an axe on one side to chop, and a hoe on the other to dig

Drip Torch

Filled with a mix of diesel and gasoline, this tool allows firefighters to create a line of fire on the ground



McLeod

Used as a rake and a hoe to cut through and clear surface materials

What tool should you use...

...if you need to cut down a large tree?

_____

...if leaves need to be cleared from the forest floor?

_____

...if an area needs to be burned to remove fuel?

_____

...if logs need to be chopped into smaller pieces?

_____

Prescribed Fire

A Story from the Fireline

"Some of my most interesting experiences as a firefighter have happened when we were actually lighting fire, instead of putting it out! This is called prescribed burning, and we do it in ecosystems that need occasional fire to stay healthy.

In southern Florida, we once did a prescribed burn along the side of a major highway. The brush, trees, and dead vegetation near the highway needed to be thinned with carefully-lit fire. At the same time, we needed to keep the highway open and safe for drivers.

When it was time to begin, firefighters used drip torches to ignite (light) the edges of the prescribed burn. The interior (inside) of the burn was lit by a helicopter. South Florida is very flat, which means that fire doesn't move much on its own, so we had to time it carefully so that the fire around the edges would be drawn towards the heat of the fire inside. We also had to pay close attention to the weather. One of the big potential (possible) hazards was smoke mixing with fog coming in from the ocean.

It took us one big day to finish igniting the prescribed burn. After that, we spent several days monitoring (watching), making sure that it didn't get outside of the prescribed area, and that the highway remained safe. The fire gradually burned down and went out, and the landscape was much healthier than it had been before. It was a big accomplishment to finish such a complicated project!"

- Firefighter PJ

Why are prescribed fires important?

_____

_____

What would happen without them?

_____

_____

YOU are the BURN BOSS!

A burn boss is someone who leads a prescribed fire operation. The burn boss uses weather and fuel conditions to determine if the operation will be successful.

Use what you learned from Firefighter PJ and decide if you can safely burn the unit in the map below.

A prescribed burn has a specific set of conditions that need to be met before ignition.

Here is your weather forecast for today:

Temperature: 90°F

Humidity: 60%

Wind Direction: South

The wind will blow your smoke north of the burn unit. Look at the map, are there any sensitive features (hospitals, schools, or airports) north of the burn unit? _____

Based on your prescription, can you safely burn this unit today?

☐ YES ☐ NO

Rx Write your prescription:

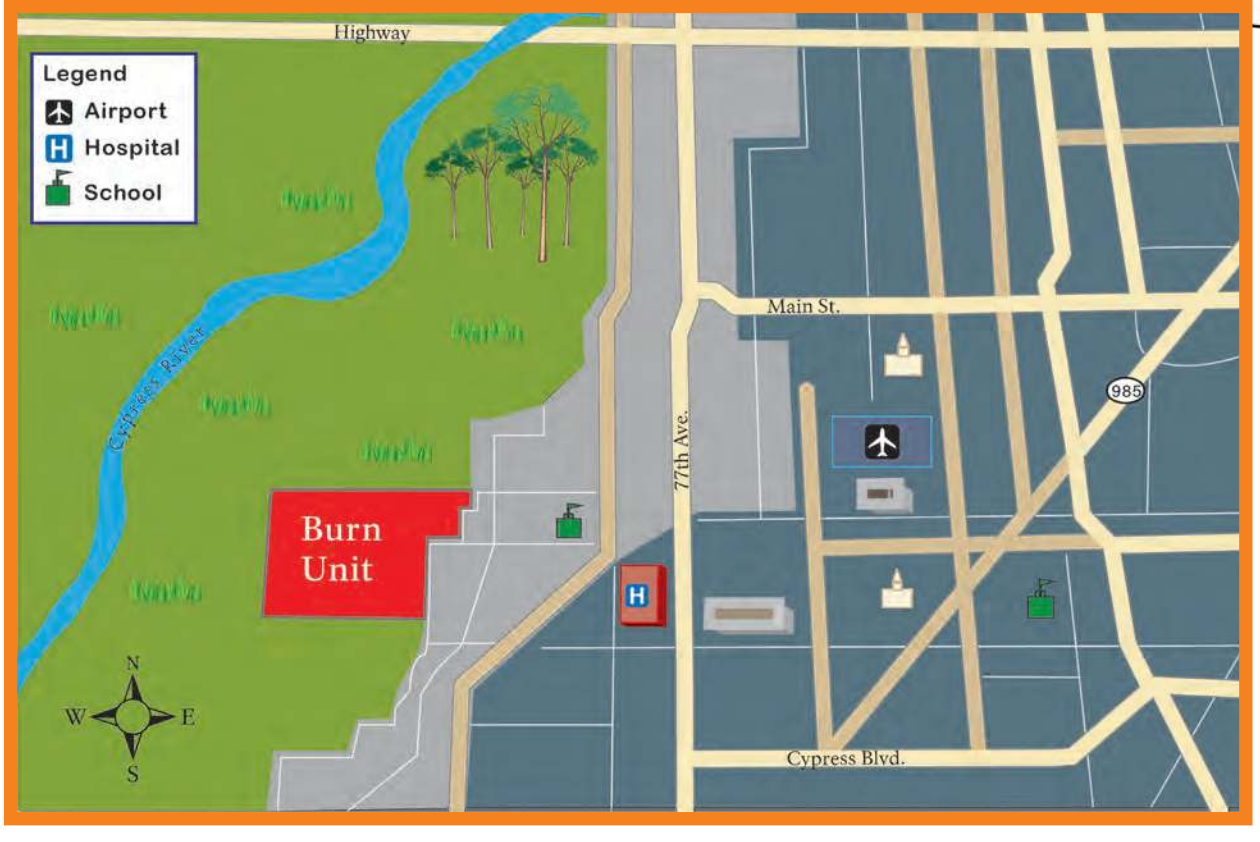
Fill in the forecast numbers (from the left) in the blanks below.

If the numbers fall between the high (H) and low (L) ranges, you are ok to burn today!

	H	L
Temperature	95°	_____ 45°
Humidity	80%	_____ 35%

Wind Direction (circle)

East or South



Fire can Restore

Benefits of Fire

Fire is a natural process that some habitats rely on to remain healthy.

Habitats that have become overgrown may not be useable to the animals that live there.

Trees that are damaged by fire may decay and leave a standing tree snag (dead tree). Snags provide soft wood that birds use to create nesting holes.

WORD SEARCH

ECOLOGY	FLAME	FIRE	SEROTINOUS
ADAPT	HABITAT	SNAG	RESTORE

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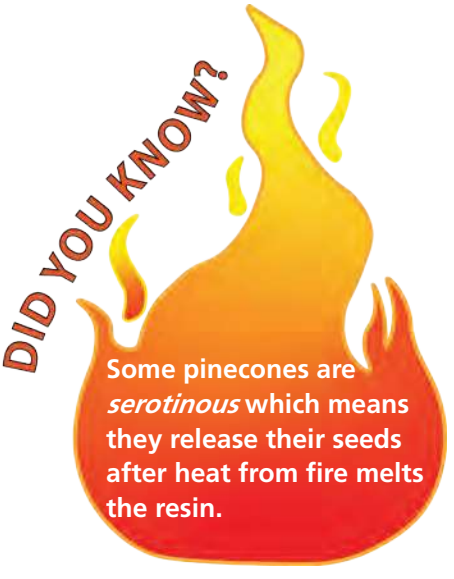
P T Z W M S B V J Y
V S I J A D A P T G



& Renew

Fire Science

Fire scientists understand how fire has shaped our historical landscapes and how to use fire to restore and maintain habitats and historical sites (like battlefields). They are experts in protecting sensitive plants, animals, and cultural resources (old buildings and artifacts) during a wildfire.

Fire ecologists study how plants and animals respond and adapt to fire.

Fire archaeologists study how fire affects cultural sites and resources.

BE A FIRE SCIENTIST!

Fire can clear the forest floor of debris and provide sunlight to new plants trying to grow.

Fire supplies nutrients to the soil which helps plants to grow.

What do you think is happening in the picture above?

_____

What clues did you use to decide this?

_____

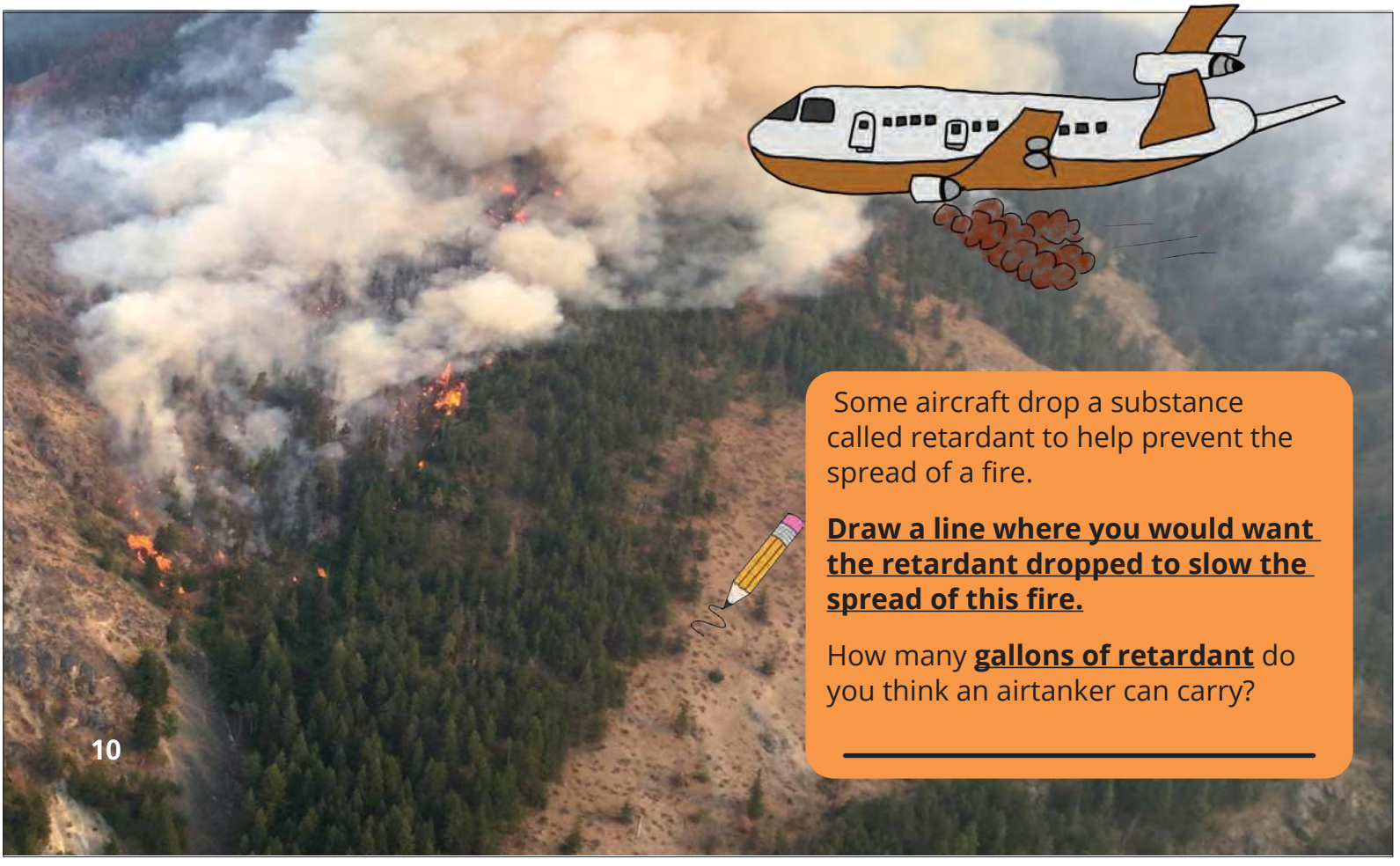
Fire Response

Help From Above

Aircraft can be used to:

- ☐ Drop water or retardant
- ☐ Deliver supplies and food
- ☐ Transport smokejumpers to a fire
- ☐ Conduct heat mapping
- ☐ Transport firefighters
- ☐ Ignite prescribed fires
- ☐ Study the fire
- ☐ Take aerial photographs

Helicopters with large buckets can collect water to be dropped on the fire. What source of water could firefighters use near your home? _____



Some aircraft drop a substance called retardant to help prevent the spread of a fire.

<u>Draw a line where you would want the retardant dropped to slow the spread of this fire.</u>

How many **<u>gallons of retardant</u>** do you think an airtanker can carry?

_____

Ground Support

Firefighters use many different vehicles and machines to help them respond to wildfire and conduct prescribed fire.

Match the picture with the correct definition.

Fire Engine

These vehicles come in different sizes, carrying water or foam off road to assist with fire suppression

Masticator

Machine that helps reduce fuel by chopping and shredding vegetation

Bulldozer

Machine with a large blade on the front; used for clearing ground

Water Tender

Used to move large amounts of water to remote locations in support of wildland fire operations

What vehicle or machine would you like to operate? Why?

Most national parks maintain their own equipment and engines.

Incident Command

Firefighters aren't the only ones who support wildland fire operations. When a wildfire occurs, a mobile site is built for support personnel, known as the Incident Command Post, or "fire camp."

Choose the correct job to match the definitions under each tent.

Incident Commander
Public Information Officer
Logistics Section Chief
Safety Officer
Finance Section Chief

<u>Draw a circle</u> around the tent you should notify about an interview request from a local news station.

<u>Draw a triangle</u> around the tent you should visit if you need to request more firefighters to help fight the flames.

Monitors personnel safety and assesses hazardous situations.

Develops and releases information about the incident to the media and the public.

Establishes incident objectives and manages the overall incident.

Maintains all cost related aspects of the incident, including personnel time.

Oversees service and support needs, requesting additional resources when necessary.

Food for Thought

Firefighters must eat at least 6,000 calories per day to maintain energy for their physically demanding days!

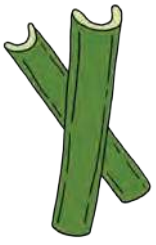
The items below are typical items found in a firefighter's lunch bag.

Ham and cheese sandwich
350 calories

Dried apricots
300 calories

Cookies
300 calories

Peanut butter and jelly sandwich
250 calories



Celery
50 calories

Cheese stick
150 calories

Apple
100 calories

Chips
300 calories

Candy bar
250 calories

Orange
50
calories

Banana chips
150 calories

How many calories will they eat for this meal? Hint: Use addition to find the answer!

Lunch = _____ calories

Stories from the Line

Rebecca

My first experience fighting fire was in the wilderness in Sequoia National Park, far from any roads. The fire was burning in an area with a lot of trees and wood on the ground, and we knew that it had the potential to grow much larger. In order to get to the fire as quickly as possible, we flew there in a helicopter, a few firefighters at a time.

Once we got there, we dug a line all the way around the perimeter of the fire down to bare soil, so the fire would not be able to spread further. Then we worked to cool the fire down by spraying water out of bags we filled up in a creek and carried on our backs. Even though we were wearing special firefighting boots, we had to be careful not to stand in the ashes for too long, because our feet would get way too hot!

We found a circle of stones in the fire area where we could see that someone had made a campfire and how the fire had crept out of their fire ring and started the wildfire. It was satisfying to know what caused the fire, but frustrating that the campers had been careless and created a dangerous situation in the park.

Elliot

One of my favorite firefighting memories is from the first time I was assigned to be a sawyer, or chainsaw operator, on my crew. We drove our trucks as close to the fire as we could, but at the end of the road, we could see that the smoke was still a couple miles away, on the side of a mountain. We grabbed everything we needed from our trucks, and started hiking. I was glad that our crew had been exercising so much, because I had to carry about 60 pounds of water, food, safety gear, and a chainsaw. The hike was steep and the air was hot, but we were all excited to get to work!

When we got to the fire, it was mostly burning on the ground under some trees and brush, but once in a while, whole trees would suddenly catch fire, sending long flames and embers into the air. We used our saws to trim branches, so it would be harder for fire to climb into the tops. We cut down dead trees that could catch fire later and shoot embers across the fireline.

It was a long, tough day working up the hill, but eventually our two groups connected at the top. With the fire fully contained within our fireline, we were finally able to take a break, celebrate our safe work, and admire the beautiful scenery, while we watched the fire to make sure it didn't escape.

After reading the stories of National Park Service firefighters, imagine what it would be like to be a member of a crew on your first fire assignment.

Write a postcard home to your family telling them about your experience.

Dear _____

To: _____

What is an item from home you would bring with you to be more comfortable on a fire assignment?

_____

Protect Your Home

Wildland Urban Interface

The Wildland Urban Interface (WUI) is where homes or other buildings are built near or in the forest, grassland, or other natural area. People living in this area must take extra precaution to protect their home from wildfire.

Immediate Zone (0-5 feet from the home):

- √ **Make sure gutters, patios, and roofs are clear of dead leaves and pine needles.**
- √ **Remove flammable mulch and vegetation within 5 feet of your home.**
- √ **Use rock mulches or hard surfaces surrounding your home.**

Intermediate zone (5-30 feet from the home):

- √ **Clear flammable objects (furniture, lawn mowers, wood piles, propane tanks).**
- √ **Remove all dead plants/leaves and weeds.**
- √ **If you have a lawn, keep it watered and mowed.**
- √ **Remove tree or shrub branches that overhang within 10 feet of your house, roof, or chimney.**

Extended zone (30-100 feet from your home):

- √ **Remove dead vegetation.**
- √ **Trim tree limbs 10 feet above the ground.**
- √ **Create separation between trees and shrubs. Trees between 30-60 feet from the home should have at least 12 feet from canopy tops and trees 60-100 feet from the home should have at least 6 feet between canopy tops.**

Go to Firewise.org or LivingWithFire.info to learn more about preparing your home for wildfire.

Fire Safety Starts with YOU!

Look at the picture below and list at least 4 things that this homeowner should fix to make their home more safe from wildfire.

1. _____

2. _____

3. _____

4. _____

Wildland Fire
Junior Ranger Activity Book

Wildland Fire Junior Ranger

As a Wildland Fire Junior Ranger,
I promise to educate others about fire's natural cycle and fire prevention. I pledge to protect my public lands and respect nature.

Junior Ranger Signature

Park Ranger Signature

National Park Service
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Special thanks to Christa Sadler for project development.