

# Space

Literacy for Anywhere - Level 5



Open  
Equal  
Free

# Print Me!

# Copy Me!

# Share Me!

# Space

## Literacy for Anywhere

Leveled Readers for the Developing World and Beyond!

### How to Use Literacy for Anywhere

This is a *Literacy for Anywhere* level 5 book. This text is designed for students in year one or grade one in school. Ideally, first grade students will be reading level one texts independently by the end of the year, second grade students will be reading level two texts, and so on. Of course, we realize that every student, classroom, and school is different, so the book level may not always correspond to the class or grade level.

If your school or library uses another system for leveling books, you can use the chart below to add *Literacy for Anywhere* books into the collection.

Levels are based on the following study: *Supplemental Information for Appendix A of the Common Core State Standards for English Language Arts and Literacy: New Research on Text Complexity*.

| Literacy for Anywhere | U.S. Common Core Band                     | The Lexile Framework® | Flesch-Kincaid |
|-----------------------|---|-----------------------|----------------|
| Starter               | Very basic books for those just starting! |                       |                |
| 1                     | <2nd                                      | <420                  | <1.98          |
| 2                     | 2nd - 3rd                                 | 420 - 620             | 1.98 - 3.5     |
| 3                     | 2nd - 3rd                                 | 620 - 820             | 3 - 5.3        |
| 4                     | 4th - 5th                                 | 740 - 880             | 4.5 - 6.1      |
| 5                     | 4th - 5th                                 | 850 - 1010            | 5.5 - 7.7      |

First Edition (CC-BY-SA) 2014 Open Equal Free Inc.

Portions of this work have been adapted or used directly from sources in the Creative Commons. See the *Attributions* section at the back of the book for a complete list of sources, authors, artists, and licenses.

Unless otherwise noted, this work is published under a Creative Commons Attribution-ShareAlike License. See end credits for any variation in licensing before adapting or using commercially. For more information on use permissions:

[www.creativecommons.org/licenses/by-sa/3.0/](http://www.creativecommons.org/licenses/by-sa/3.0/)

Additional *Literacy for Anywhere* titles as well as books for teachers, administrators, NGOs, and more at:

[www.TheAnywhereLibrary.com](http://www.TheAnywhereLibrary.com)

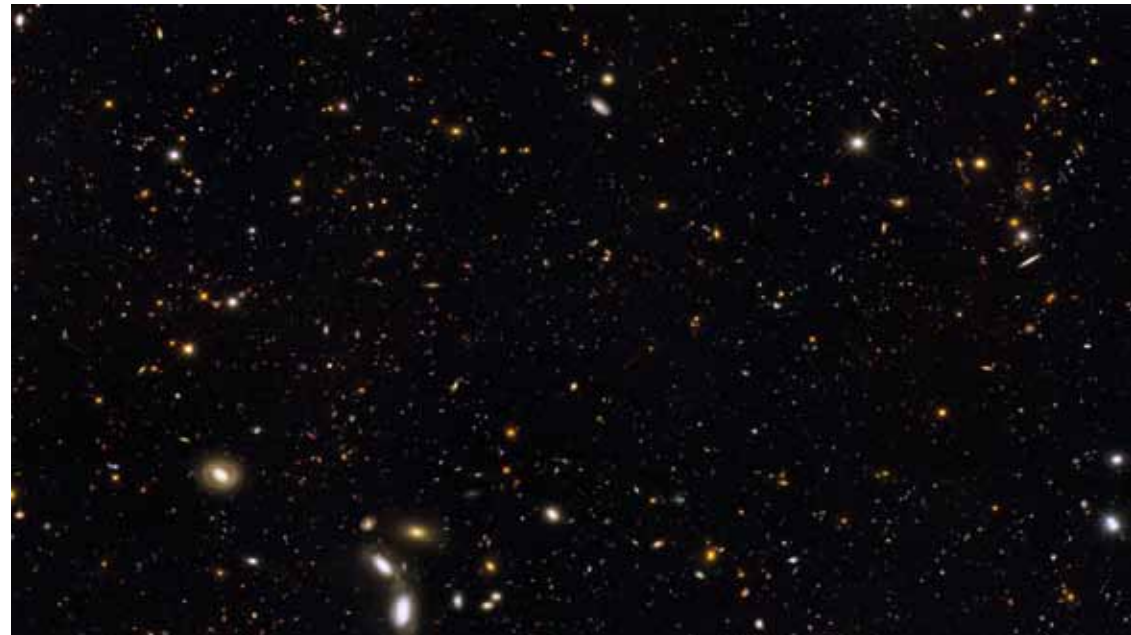
# Space

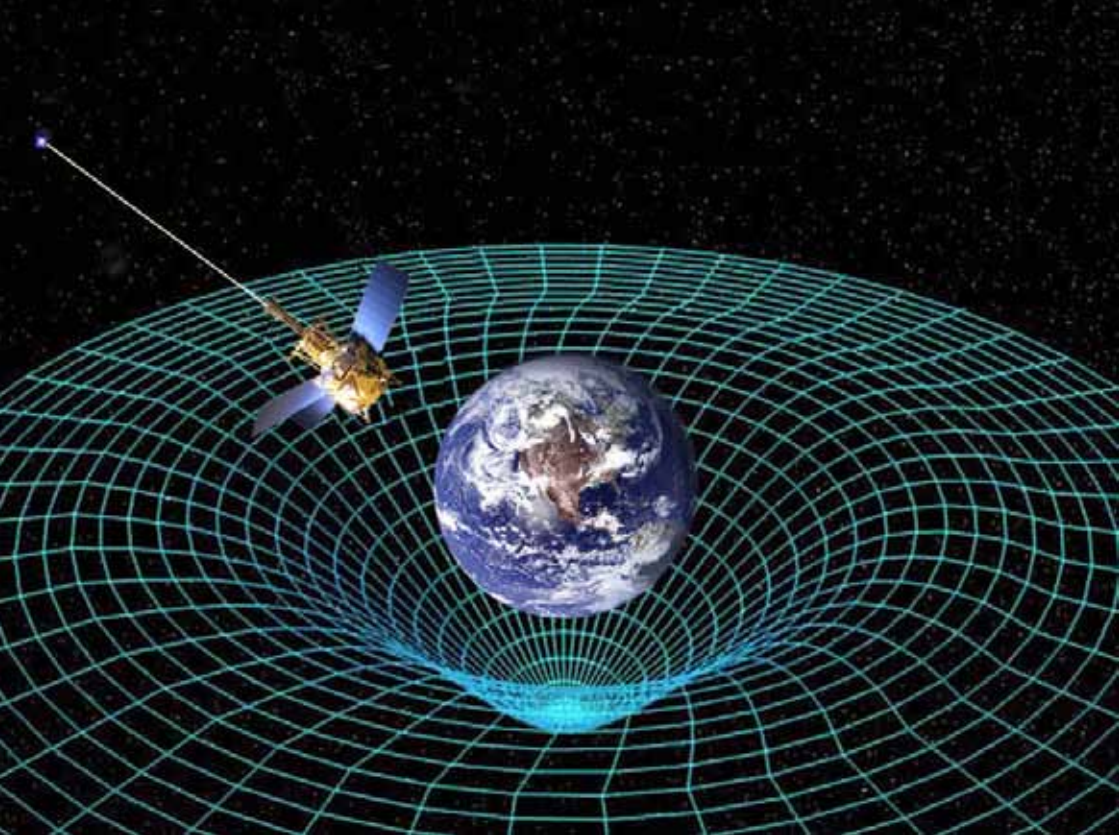
## Level 5

Space is huge, it may even be infinite, which means it goes on and on forever. There are many different solar systems, planets, stars, meteors, and other objects in space.

The Universe is the name we have given to everything we can observe, both on Earth and in space. We have never been able to measure the size of the universe because it seems to spread out forever.

When you look into the sky, you can often see many stars and planets, but there are many other objects that you cannot see. Some of these are big but very far away, while some are much smaller but closer than our own Sun. In fact, the universe is so big and has so many suns and planets that some people think there may be other life somewhere in space.





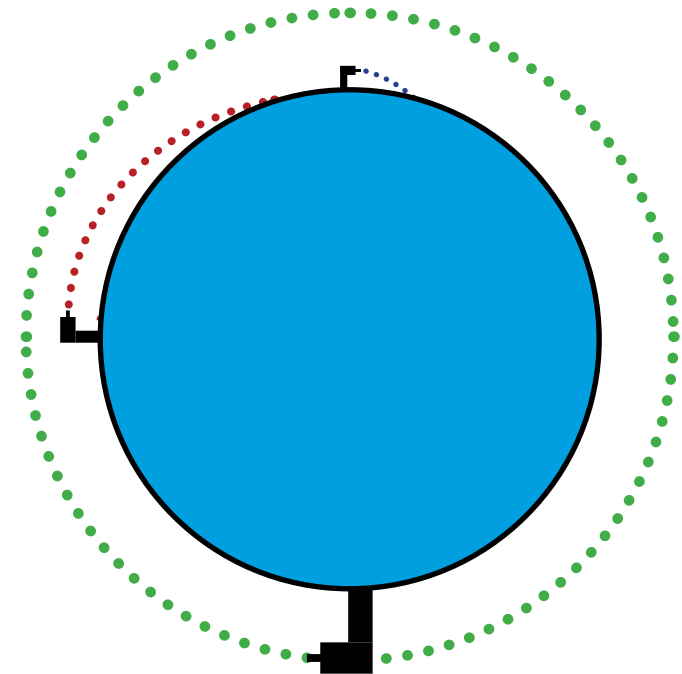
How does gravity make an orbit? Why don't we fall into the sun?

Imagine throwing a ball as hard as you can. It would go straight for a while, but eventually it would hit the ground. The same is true for shooting a gun, it might go straight for a mile or two, but eventually it will fall and hit the ground.

Throwing a ball or shooting a gun is like making a short orbit. If you could throw or shoot far enough from high enough, the ball would fall after the Earth starts to curve. If it keeps falling after the Earth curves, it will fall forever, never touching the Earth. You'd have to move out of the way so it didn't hit you in the back.

Gravity is a force found throughout the entire universe. When you are close to something big, like a planet or a sun, it pulls you towards it. The reason things fall is because the earth's gravity is pulling it back.

Gravity is the reason why a ball falls back to the ground after you throw it, the reason that the moon orbits around the earth, and the reason that the earth orbits around the sun.







The Sun is actually a star. Some of the other stars have planets like our Sun and some do not. Our Sun is 109 times bigger than Earth and it has been active for 4.5 billion years.

The sun is a giant ball of fire. The middle of the sun is called the core and is the hottest part. The heat of the sun provides the energy for almost all of the life on earth. Plants get their energy from the sun. Animals eat plants, which are then eaten by other animals. We need the sun to survive.

As a planet travels around the sun, a different part of it faces the sun at different times. The part that is facing the sun is lit up and has daytime. The part that is facing away is dark and has nighttime. As the Earth spins we see it get light and dark every day.

The sun seems big and bright but it is only a medium sized star. There are many stars outside of our solar system. Every star is unique and has been active at different times.

Stars last for a very long time and change a lot as time passes. They go through many different life stages, grow and shrink, and can explode when they finally die.

Many of the stars we can see from Earth died hundreds and thousands of years ago. Since light has to travel so far through space to get to us, we can see a star after it is dead.





When bright stars seem to form shapes in the sky they are called constellations. Sometimes, these constellations become famous as people show them to their friends. There are about 30 famous constellations that humans have named. One example is Orion in the northern hemisphere.

Many planets circling a sun is called a solar system. Many stars and solar systems spiraling together is called a galaxy. This is the "Sombrero Galaxy," named because it looks like a hat.

Our solar system is in a galaxy called The Milky Way. The name 'Milky Way' was created because from Earth, the Milky Way looks like a long, white path across the sky. You can see an example on page 5. Our view is similar to being in the center of the Sombrero Galaxy and looking out through all the other stars.

The Milky Way is very large, larger than anything we can imagine. The Milky Way is thought to contain around 100 - 400 billion stars, including our sun. The oldest known star in our galaxy is at least 13.6 billion years old.



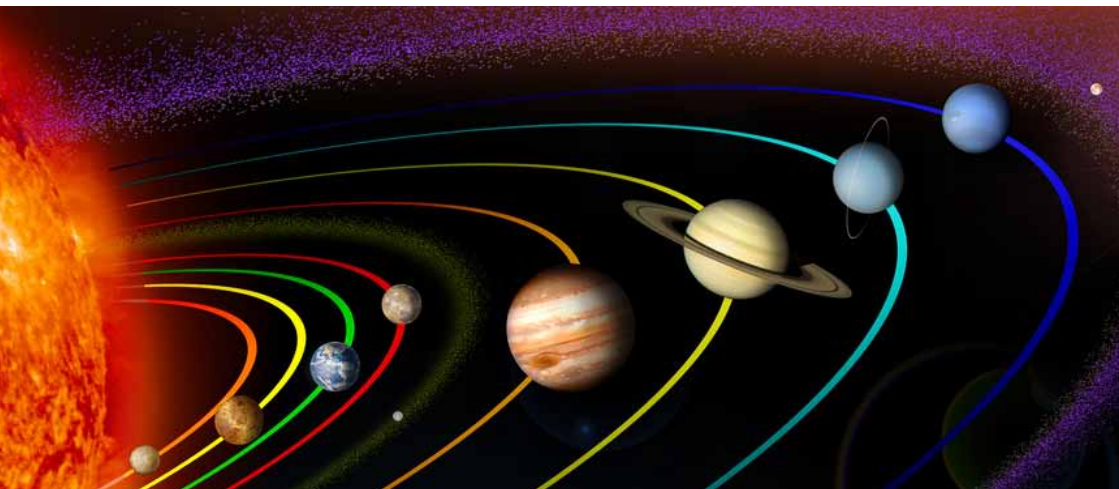


The Sun is a star in the galaxy but it is also the center of our solar system. The gravitational pull from the Sun keeps all the planets close together. This is why we call it one system.

The planets in our solar system revolve around the sun. Planets close to the sun are very hot. As the planets get further from the sun they get colder and darker. The planets always stay in the same order, but move around the sun in paths called orbits.

Each planet also spins on its center or axis like a top or doorknob. So, every planet moves in a circle around the sun and spins around its center. The time it takes to go around the sun is one year. The time it takes to spin around its axis is one day.

The Earth spins around its axis about 365 times while it goes all the way around the Sun. This is what makes our days and years.



The closest planet to the Sun, or first planet in the Solar System, is Mercury. It only takes Mercury 88 days to go all the way around the sun, making it the fastest of all the planets.

Mercury got its name because it was so fast. In ancient Rome, Mercury was a god famous for speed. All of the planets in our solar system are named after Roman gods in the West.

The temperature on Mercury is very hot in the middle and very cold at the poles. It is the smallest planet in our Solar System and is made of rock like the planet Earth but covered in craters like the surface of the moon. Sometimes, Mercury can be seen from Earth, but only in the morning or the evening.

The second planet in the solar system is Venus. It is sometimes called Earth's sister planet because it is similar in size and shape.

Venus is the hottest planet in the Solar System and is covered in 167 volcanoes. One rotation around the sun lasts 224 days. We don't know what the surface of Venus looks like because it is covered in a thick layer of clouds. The surface of Venus is most likely a desert covered in large slabs of rock.

Earth is the third planet in the Solar System. The Earth is the only planet in the Solar System that is known to be the home of living things. The Earth is home to over 8.7 million species, from plants to insects to birds to mammals to humans.

The Earth is thought to be around four and a half billion years old. One rotation around the sun lasts 365 days or one year. The middle of the Earth is called the equator and is the hottest part. The poles are at the top and the bottom of planet Earth, and they are the coldest parts.



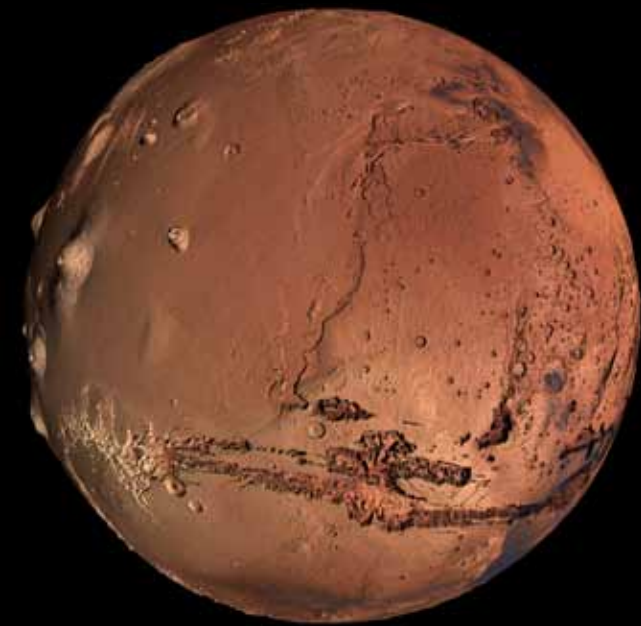




The Earth is not alone in its journey around the sun. Just like the Earth revolves around the Sun, the Moon revolves around the Earth. Our moon does not give out light like a candle, it reflects light from the sun like a mirror.

The moon appears to have different shapes at different times of the month. This is because of its position between the sun and the Earth. Sometimes you can only see some of the half lit by the sun. Sometimes you can't see any at all.

The moon is the only other place in the solar system that has been walked on by a human being. American astronaut Neil Armstrong was the first human to walk on the moon on July 16, 1969.



The fourth planet in the Solar System is Mars. The soil on Mars is full of iron and rust so the planet looks red from Earth. Because of this it is called the red planet.

Mars is the second smallest planet after Mercury. It is made of rock and has similar features to Earth, such as mountains, valleys, and volcanoes. Many people think that there may have been life on Mars in the past because evidence of water has been found there. Liquid water is very rare in space.

Mars contains the largest mountain in the Solar System, known as Olympus Mons.

Jupiter, the fifth planet from the Sun, is the biggest planet in the Solar System. Unlike Earth, Mars, and Venus, Jupiter is made of gas, not rock. Jupiter is colder than these planets because it is further from the sun. Jupiter has 67 moons, one of which is bigger than Mercury.

Jupiter has a giant storm that looks like a big red dot. Several spacecrafts, but no humans, have explored Jupiter. On a clear night with no moon, Jupiter can be seen from Earth and it is the third brightest object in the sky after Mercury and Venus.

Next comes Saturn, the sixth planet in the solar system and the second biggest after Jupiter. Saturn is very different from Earth. It is made of metals, liquid hydrogen and helium, and gas.

Saturn has 62 moons, but only 53 of them have been named. Saturn's radius is nine times bigger than Earth. Saturn is a very windy planet, with some of the fastest winds in the solar system.

Saturn has nine rings made of ice and rock that circle it. You can always tell Saturn in drawings and pictures because you can see its rings.





Neptune is the last planet in the solar system at number eight. It is the coldest planet in the solar system because it is so far from the sun. It is the fourth largest planet, and the heaviest.

At first, Astronomers guessed the location of Neptune by observing other objects in our solar system. It wasn't until later that they were able to see it in a telescope.

Neptune has fourteen moons. The biggest one is named Triton. Neptune has been observed by one spacecraft, named Voyager 2, which flew very near the planet on August 24, 1989. Neptune is known for its great storms that make visible marks on its surface.

The seventh planet in the Solar System is named Uranus. Uranus is sometimes described as the 'ice giant' because it is one of the largest and coldest of all of the planets to be discovered by ancient astronomers.

Uranus was the first planet to be discovered using a telescope. It was classified as a planet in 1783 and named after the Roman god of the sky. Before this, most people thought that Uranus was only a star.

It takes 84 Earth years for Uranus to go around the Sun only one time. Uranus has rings and many moons. It is unique because its axis is tilted sideways so far that it is nearly orbiting on its side.





Pluto used to be considered the ninth and last planet in the Solar System. However, in 2006 it was decided that Pluto was not a planet, but a “dwarf planet” because it is so small.

Pluto is mainly made of rock and ice, and is very small. It is six times smaller than the Earth’s moon and has five moons of its own. Pluto was named after the Roman god of the underworld. It takes 248 Earth years for Pluto to move once around the sun.

Asteroids are small objects made of rock and ice that circle the sun like planets. The first asteroids to be discovered were given names and symbols, starting with Ceres, in 1801. The first man to discover an asteroid was Giuseppe Piazzi, who thought it was a new planet. Asteroids can even have little moons, like 243 Ida shown below.



Comets are small icy rocks that float around the Solar System. As they move closer to the sun they heat up and release gas. This gas lights up and is sometimes visible to the human eye from Earth. Because of this brightness, many people have seen and recorded comets since ancient times.

Comets are different from asteroids. Asteroids do not have tails of gas that light up. In July 2013 there were 4,894 comets known to humans. This number is increasing all the time. Humans see at least one comet per year from Earth.



Humans have been fascinated by space for thousands of years. NASA is one of the largest organizations that works in and explores outer space. NASA observes space from earth and builds spacecrafts that take astronauts and robots into space.

Spacecrafts go into space to discover new scientific facts. Humans have landed on the moon and sent robots to Mars. In June 2011, the United States reported that 523 humans had visited space.





The first man to go into space was Russian astronaut Yuri Gagarin on April 12, 1961. He travelled around the Earth in an orbit that lasted 108 minutes.

The first woman to enter space was Valentina Tereshkova, who travelled on June 16, 1963.

The youngest person to fly in space was Gherman Titov, who flew in Volstok 2 at the age of 25.

The oldest person who has flown in space is John Glenn. Glenn was 77 when he flew on a spacecraft called STS 95. The longest stay in space was 438 days, by Valeria Polyakov.

Satellites are objects that orbit a planet. Moons are a type of satellite, but some satellites are man-made objects that have been placed in space to travel around the earth.

The first man-made satellite was named Sputnik 1 and was sent to orbit the Earth in 1957. Since that time, thousands of satellites have been placed around the Earth by many different countries. Satellites are used for many reasons, including observations of the Earth, recording the weather, and for communication.

Man-made satellites are controlled by computers and are pushed into space using rockets. When satellites finish their work they are switched off, but are usually not removed from space because it is expensive. Instead they just stay where they are, as useless space garbage.





Telescopes are tools used to look at objects far away and are very important to studying space. The first telescopes that we know of were used in the Netherlands at the beginning of the 17th century.

There are many different types of telescope. Some telescopes use reflections in mirrors to see things from very far away. Other telescopes use X rays. Some are small and can be carried; others are as large as a house or even bigger!



In the future, humans will go further and see more than ever before. New spacesuits will help astronauts survive in difficult conditions, including extreme temperatures, radiation, and dust. NASA is also planning to build new communication systems using lasers that will be able to transfer more information from space to earth than ever before. Some companies are even working on taking people to space just for fun.

Some places in space are still too dangerous for humans and will be for a long time; because of this, NASA builds robots to go into space to explore areas that humans cannot. Space still has a lot of mysteries, but every day we learn more than has ever been known before.

# Space

## Review Questions!



1. What is the universe?
2. Why can't we measure the size of space?
3. How many planets are in our Solar System? How many planets were named before 2006?
4. What planet is said to be our sister planet, why?
5. What planet is most likely to have had life in the past? Why do people think this?
6. How do orbits work? Why don't we crash into the Sun? Why doesn't the Moon crash into us?
7. What is a difference between an asteroid and a comet?

# Space

## Design Project!



Design a space suit! Think of everything a space suit would need to let you live in space. Space has no air, no food, and no water. Draw and label a suit that would keep you alive and comfortable while you explore the galaxy.

# Attributions

## Contributing Authors, Organizations, and Photographers

### Words & Layout

Author: Ashleigh Brown

Editing and Layout: Michael A. Jones

Co-editors: Hannah Bradley, Jessica Eby, Jessica Wheeler

### Photography

Unless otherwise noted, photographs are in the public domain. 8. madmiked (Flickr | BY-SA), 10. [Left] Allthesky.com (BY-SA) [Right] Blueshade (Wikimedia | BY-SA), 11, 12, 13, 15, 22: NASA Goddard Photo and Video (Flickr | BY), 14. iranglانه (Wikimedia | BY-SA), 19. European Southern Observatory (Flickr | BY), 20. European Southern Observatory (Wikimedia | BY), 23. Kestrel (Wikimedia | BY-SA)

### *For Anywhere*

Any derivations of this work not approved by Open Equal Free must likewise change the title and layout of the work and not appear to be part of Open Equal Free's *For Anywhere* series. Making a new or altered book (other than simple translation) appear to be part of the *For Anywhere* series is considered by Open Equal Free to imply endorsement and must have written permission.

## Special Thanks!

We would like to extend a special thank you  
to the following contributors:

Megan Smith

Elissa Alvey

Dane Stogner

*We would also like to thank Leigh Morlock for her contributions  
as a design and marketing consultant on this project.*



# Open Equal Free

See our family of free resources and programs at:

**[OpenEqualFree.org](https://OpenEqualFree.org)**