

WORKBOOK

ESSENTIAL OIL EDITION

Welcome to dōTERRA[®] Science for Kids

Curiosity is a natural part of life for children. The dōTERRA Science for Kids program seeks to encourage this fundamental love of exploration. Our resources can be used at home and in the community to learn more about the world through scientific discovery. By partnering this workbook with dōTERRA Science for Kids online content, you will find the tools to help your little scientists foster a love of science and build knowledge in basic chemistry, essential oils, and health.

dōTERRA Science for Kids seeks to promote science education for children of various ages worldwide by encouraging curiosity, exploration, and discovery. We accomplish this by:

- Providing tools and resources that enable parents to help their children learn about science at home
- Presenting scientific lessons in our local community, both at schools and here at dōTERRA campus
- Donating to schools and scientific programs through the dōTERRA Healing Hands Foundation[®]

dōTERRA Science for Kids offers scientific modules, experiments, and activities that can be enjoyed by children of all ages. As you use these resources, keep in mind:

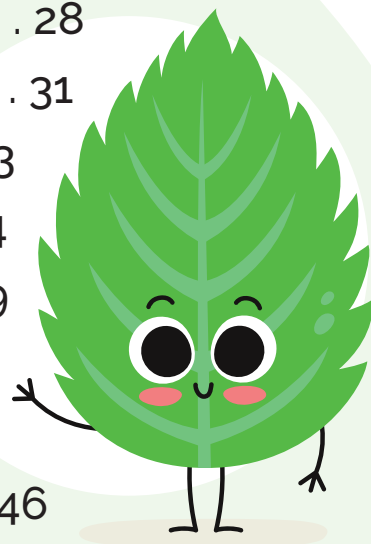
- Before beginning any experiment or activity, make sure to have appropriate adult supervision. Some experiments involve heat or sharp objects, which must be used with care.
- When cooking, make sure to follow proper hand-washing guidelines. Tip for parents: dōTERRA On Guard[®] Foaming Hand Wash is a great product to use when working in the kitchen!

Enjoy!

What's Inside?

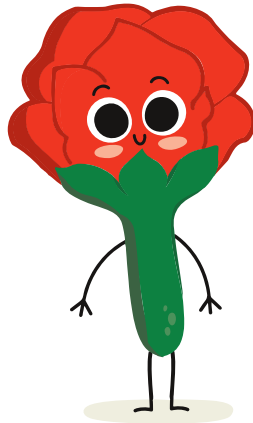
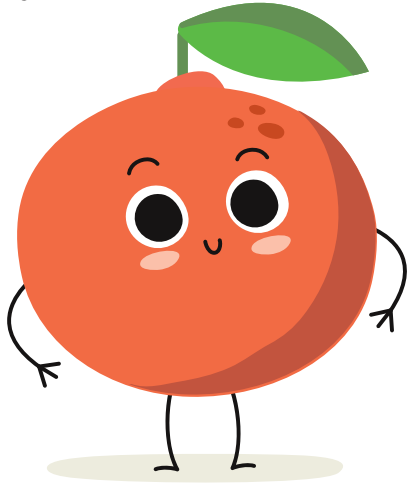
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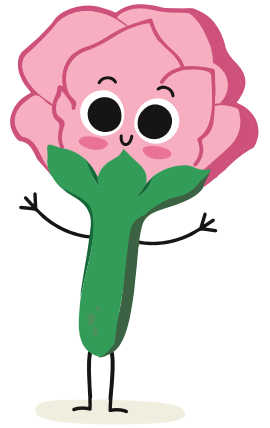
Meet the Plants!

GWEN
the Grapefruit

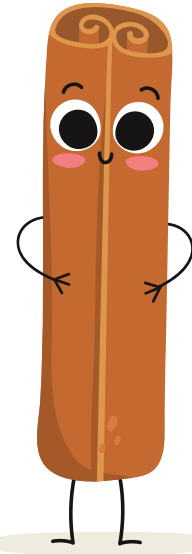


REX
the Rose

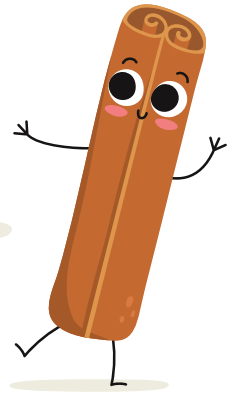
RITA
the Rose



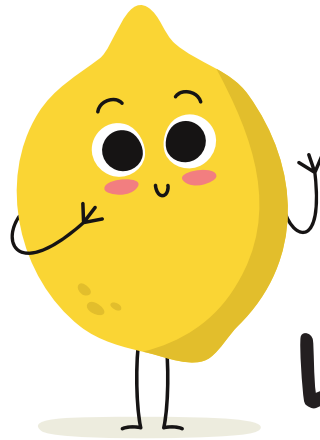
CHARLIE
the Cinnamon Stick



CECE



PERRY
the Peppermint Leaf



LASZLO
the Lemon

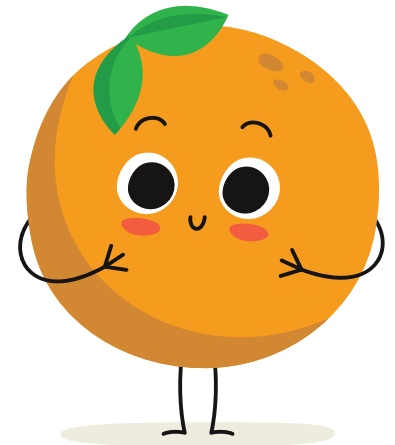


PAT

PETRA



OLLIE
the Orange



What Is Science?

You learn about it in school, watch videos about it, and maybe even do science experiments on your own. You may have heard that dōTERRA is a "science-based" company. . . but what is science, exactly?



SCIENCE

Science is a branch of knowledge or a study that uses information (also known as facts) gained about the natural world through experiments and observations.

Put simply, science and scientific study are how people learn about the natural world. It's because of science that we know how plants get their food, how weather is made, and how the human body works.

Why is science important?

How do you use science in your life?

Science in History

Science has played a key role throughout human history. Many important discoveries were made hundreds, even thousands, of years ago. For example, in 1543, **Nicholas Copernicus** published his theory that the sun is at the center of the solar system. Gravity was discovered by **Sir Isaac Newton** in 1666. History is full of amazing scientific discoveries and the cool thing about science is that there is always more to learn and discover! Once one question gets answered, it opens the door to ask hundreds more, making it possible for scientists to continue learning as they conduct experiments using the scientific method.

COOL SCIENTIST

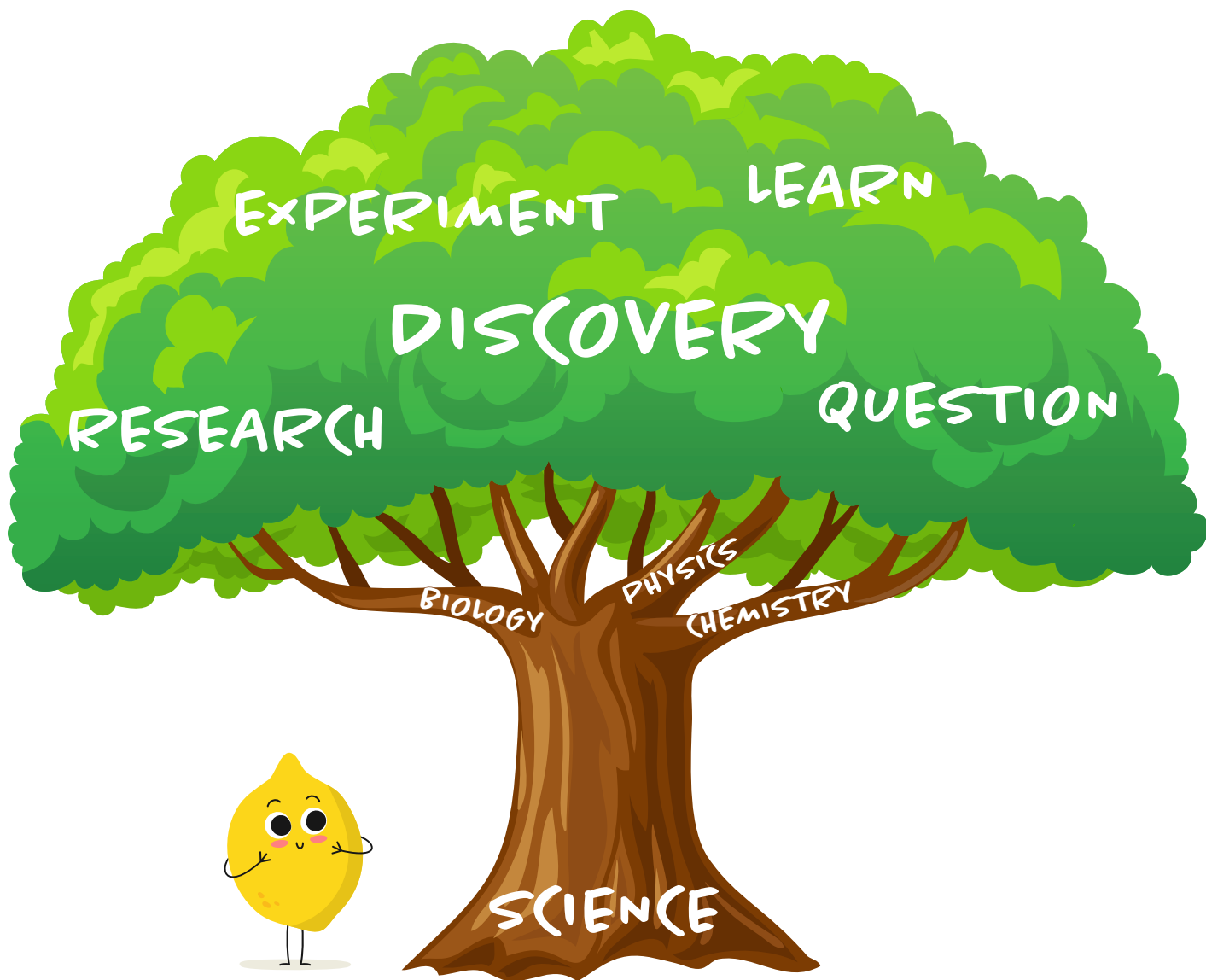
Did you know that **Albert Einstein**, one of the most famous scientists of all time, first became interested in science because of a compass? His father gave it to him as a gift and he wanted to figure out how it worked.



Different Branches of Science

Because there is so much to learn, scientists often pick one specific thing to study. There are a lot of different fields in science and each contributes to our understanding of the world around us. A few fields of scientific study include biology, health science, and chemistry.

If you were a scientist, what would you study?



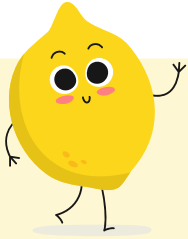
Science Is Cool

Scientists study almost everything! There are so many different parts of science that you can explore. Find what interests you and start asking questions. There is so much to learn about the world and science is a great place to start. This workbook just scratches the surface of science, but it can be an excellent tool to help you learn more about the world and how it works.

The Scientific Method

The scientific method provides steps that help you find answers while documenting each step so that other people can repeat your experiment and test your findings.

Step 1: ASK A QUESTION



Every science experiment begins with a question—something you want to learn or explain. Once you have a question, the scientific method can help you find the answer!

Write down one question you'd like to answer:

Step 2: BACKGROUND RESEARCH

Background research helps you find experiments other people have done to answer the same or similar questions and helps you understand the basic science surrounding your question.

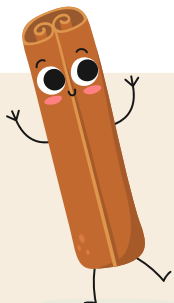
What information should you look for when doing research?

What resources could you use to help you research?



Step 3: FORM A HYPOTHESIS

A hypothesis is a prediction or an educated guess based on your research and previous knowledge. It is when you guess what you think is the answer to your question.



How do you develop a hypothesis?

Step 4: EXPERIMENT

An experiment is a step-by-step procedure you follow to see if your hypothesis is right or wrong. As you conduct your experiment, make sure to record your results and observations so that you have information to review as you analyze the experiment in the next step.

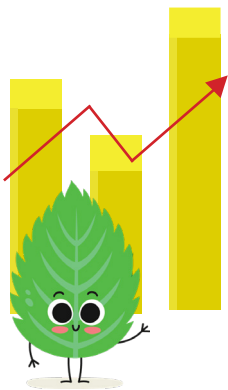
List an experiment you've done before or one that you think would be fun to do.



Step 5: ANALYSIS

Once you have completed your experiment, you will need to review (also known as analyze) the results. Analysis looks for patterns or broken patterns in your findings.

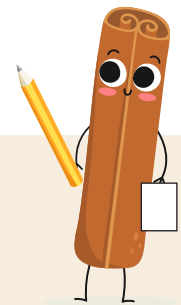
Why is it important to analyze your results?



Step 6: CONCLUSION

In your conclusion, you will summarize your experiment and share what those results mean for your hypothesis.

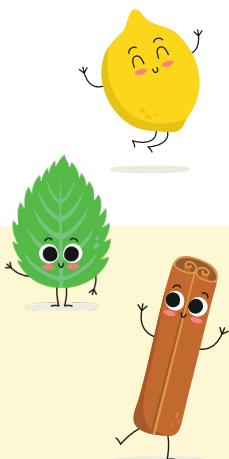
Why do you think a conclusion is important?



Step 7: SHARE YOUR RESULTS

The final step of any experiment is sharing your results and conclusion. The knowledge gained in conducting an experiment can help others as they work to learn more about the world that surrounds them.

How will you share your results as you conduct experiments at home? Why is sharing results important?



Scientific Method Experiment

For this experiment, you will be using the scientific method to answer the following question: Which essential oil has the greatest density: Wintergreen, Cinnamon, or Lemon? Part of the scientific method is background research. For this experiment the background you need to know is that oil doesn't mix with water and the densest oil will sink in the water.

What You'll Need:

- 3 transparent cups

(smaller cups work better because it's easier to see where the oil is without having to use a lot of water or essential oil)

- A spoon
- Water
- Wintergreen essential oil
- Cinnamon essential oil
- Lemon essential oil
- Tape
- A marker
- *Ask a parent or adult before using the essential oils in this experiment.*



What You'll Do:

1. Before beginning the experiment, take a moment to write down your hypothesis on question 1 of your "What You Discovered Worksheet."
2. Using the tape and marker, label each cup with either Wintergreen, Cinnamon, or Lemon so that you can keep track of which oil you will put in each cup.
3. Next, fill each cup up with water.
4. Start with Lemon essential oil and drop several drops of essential oil into the cup labeled lemon. You want to put in enough oil that you can see it in the water.
5. Answer question 2 on your "What You Discovered" worksheet.



6. Repeat step 5 for both Cinnamon and Wintergreen essential oils, taking time to answer questions 3 and 4 on your "What You Discovered" worksheet.
7. Complete your worksheet, answering questions 5-8 to write your conclusion.
8. Once you're done filling out your worksheet, add your water and oil mixtures to a diffuser so that you can enjoy the aromatic benefits of these essential oils.



What Does It Mean:

Adjusting one variable in an experiment allows you to see changes and link those changes to one cause. By changing the essential oil added to a glass of water you are able to directly compare which essential oil is most dense.

Changing only one variable is key to the scientific method. The scientific method allows you to find answers to a wide range of questions in all disciplines of science. This applies to physics, chemistry, and all other areas of science. The scientific method is an important part of learning and discovery as people continue to investigate the world around them.

What to Do Next:

Repeat this experiment, but use different essential oils to learn their density and how they compare to each other.

With your parent's permission, share your results and photos of your density experiment online using the hashtag #doterrascienceforkids.



**YOU'RE ON YOUR WAY TO
BECOMING A SCIENTIST.**

What You Discovered

1. Which essential oil do you think will be the densest?
Lemon, Cinnamon, or Wintergreen?

2. Where does the Lemon essential oil rest in the water?
Is it on top of the water? Under the water? Level with the water?

3. Where does the Cinnamon essential oil rest in the water?

4. Where does the Wintergreen essential oil rest in the water?

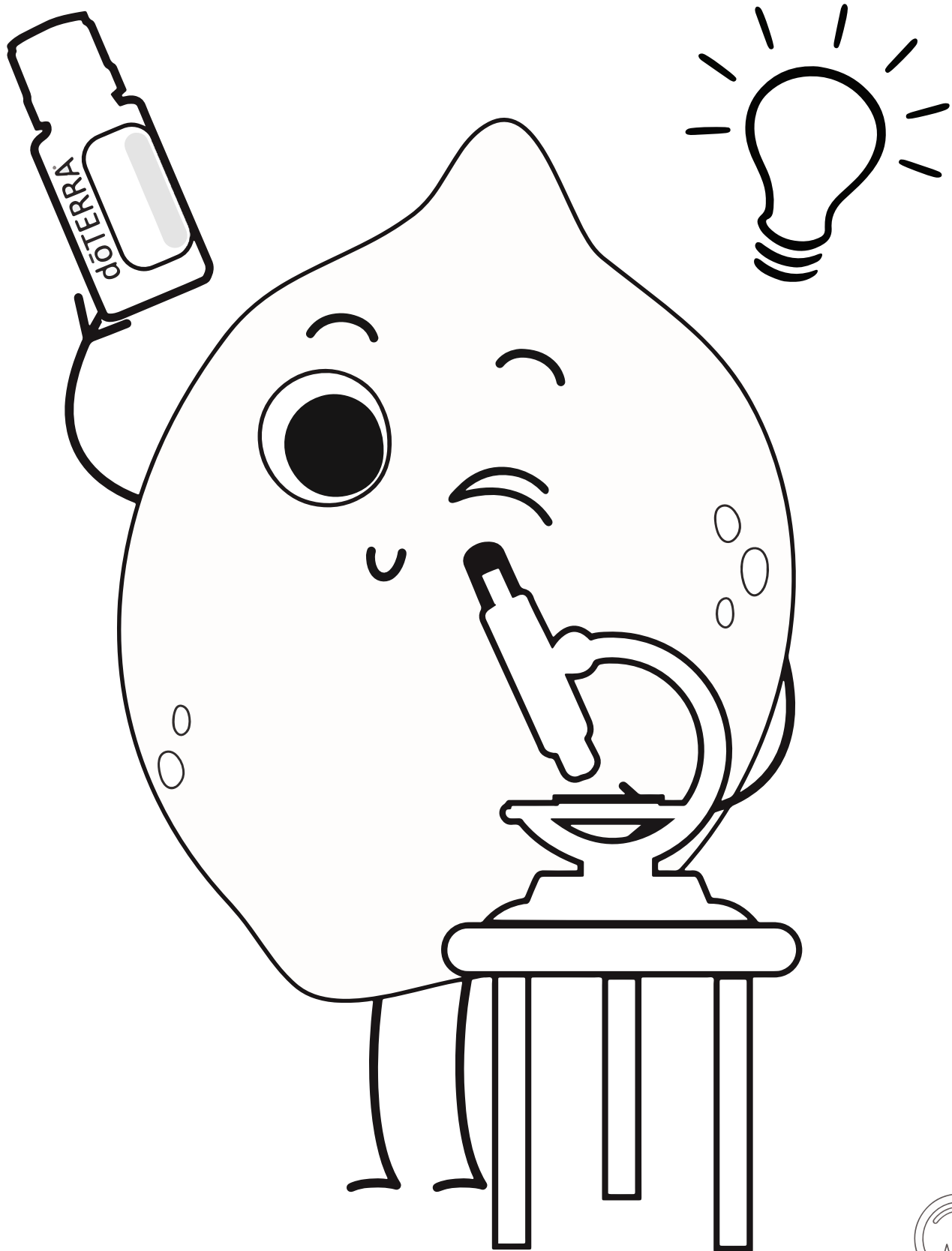
5. Compare all three glasses. Which essential oil is the densest?
(Hint: This oil will be the one that rests the lowest in the water.)

6. Do the results match your hypothesis? Did you guess correctly?

7. Why do you think the scientific method is important?

8. What did you learn from following the scientific method?

Color Laszlo the Lemon!



What Is an Essential Oil?

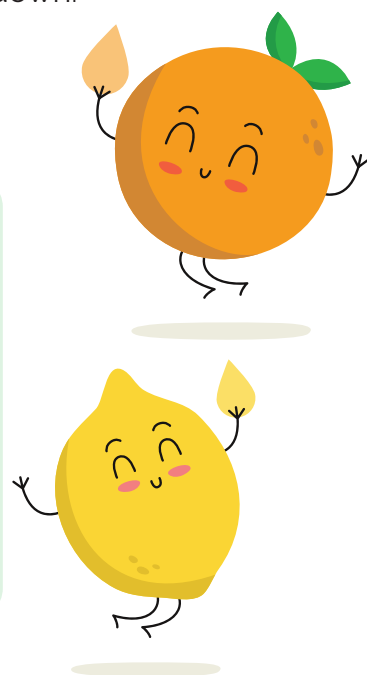
Besides a nice smell in a bottle, have you ever wondered what an essential oil is? The definition may sound a bit complicated at first. Don't worry, we'll break it down.

An essential oil is a **hydrophobic** liquid that contains **volatile aromatic compounds** from the various parts of plants.

Questions:

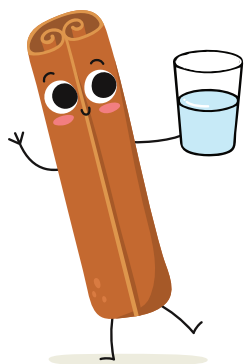
What is your favorite essential oil?

Why is it your favorite?



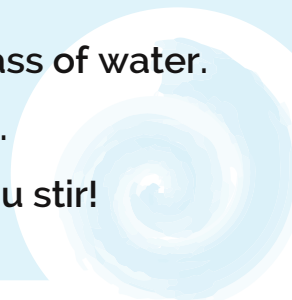
Let's Define "Hydrophobic"

Essential oils are **hydrophobic**, which means they are repelled by water. If you try to mix an oil with water, the oil will separate from the water instead of mixing in.



Try this experiment:

- Pour a few drops of dōTERRA® oil into a glass of water.
- Try to stir the liquids together with a spoon.
- Notice that they do not mix—even when you stir!



Let's Define "Volatile"

Because essential oils are **volatile**, they can change their state of matter (solid, liquid, gas) quickly. This trait assists in the extraction of most essential oils, as they quickly change states during the distillation process.

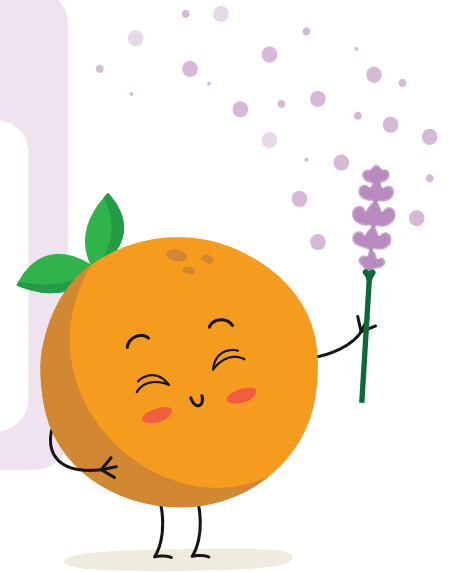


Let's Define "Aromatic"

Aromatic means that something has a distinct smell. For example, lavender plants are aromatic because their flowers have a specific floral, powdery scent. Each essential oil has its own aroma that is determined by the chemical makeup of the plant it comes from.

Question:

What are some of your favorite smells?



Let's Define "Compounds"

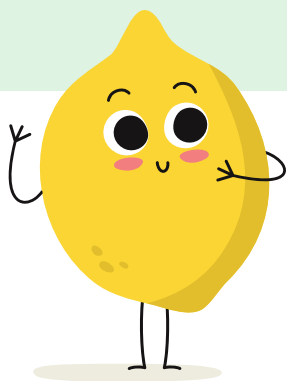
A **compound** is a mixture of two or more elements, the purest form of a substance. Water is a well-known compound because it is a mixture of the elements hydrogen and oxygen. Essential oils are made of many different elements and molecules.



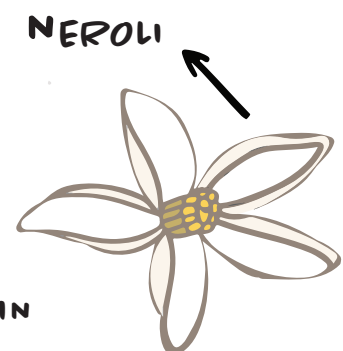
Fun Fact!

Not all compounds have a distinct smell. For instance, pure water does not smell much like anything. This is why essential oils are identified as

aromatic compounds.

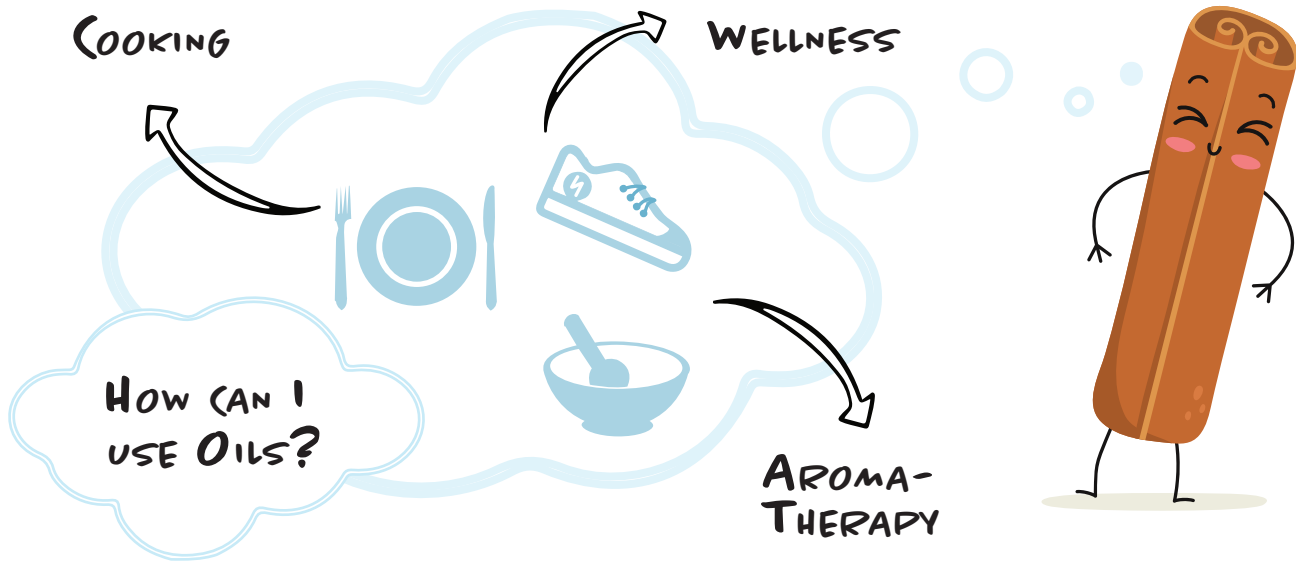


Aromatic compounds can come from many different parts of a plant, such as the flowers, seeds, roots, leaves, and stems. For instance, Wild Orange essential oil comes from the rinds of the oranges, while Petitgrain comes from the leaves and twigs, and Neroli oil comes from the flowers on the orange tree.



Let's Review

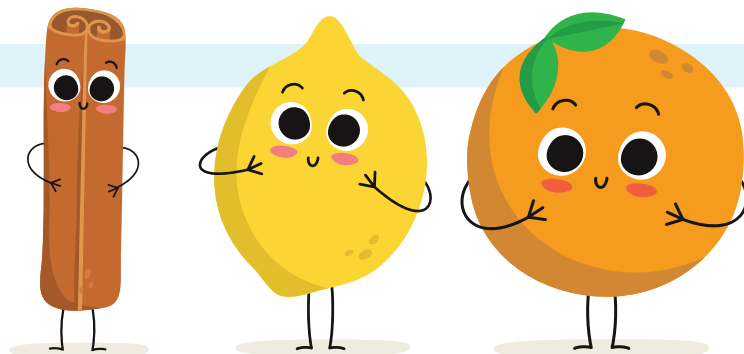
Essential oils have been used for thousands of years in a variety of physical and emotional applications. dōTERRA® continues to provide the purest and most potent essential oils that can be used in skin care products, aromatherapy, food preparation, healthcare practices, and more.



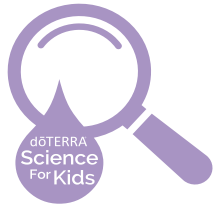
When you break it down, essential oils are not too difficult to understand after all! Once you understand what essential oils are and where they come from, you can begin to understand the countless benefits we can receive from incorporating them into our daily lives.

Question:

What do you use oils for?



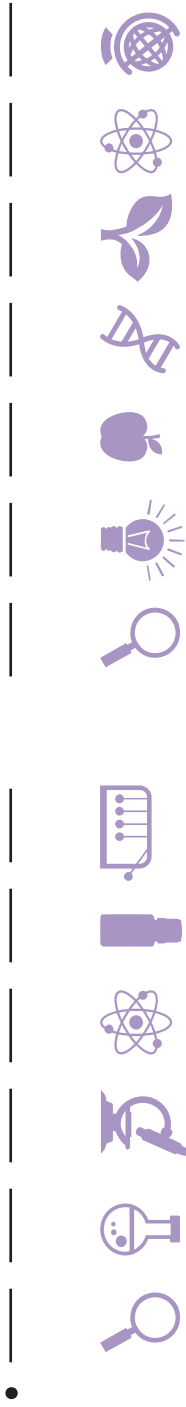
Secret Message Activity



Break the Code!

There's so much to learn about essential oils. Use this key to break the code on the next page and learn a fun fact.





Distillation

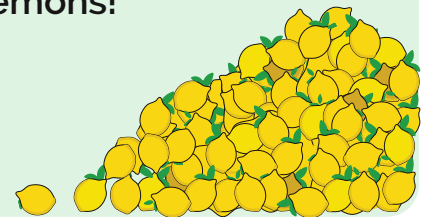
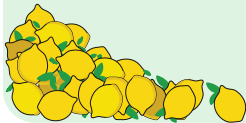
Essential oils come from tiny sacs on the surface and insides of a plant. So, how do you get it out? Extracting these oils requires a process called distillation.

Distillation extracts the important parts (essential oils) from plant material. There are many forms of distillation. dōTERRA uses **steam distillation**, **expression** (also known as cold pressing), and **solvent extraction**.



Fun Fact!

It takes about 75 lemons to make one 15 mL bottle of Lemon essential oil. That's a lot of lemons!



Purity and Potency: The 3 Factors

There are three important factors within the distillation process that may affect the quality or strength of the substance that is distilled.

1. Heat Source

If the temperature is too low, the distillation process will not be effective. If it is too high, there is a risk of damaging the substances.

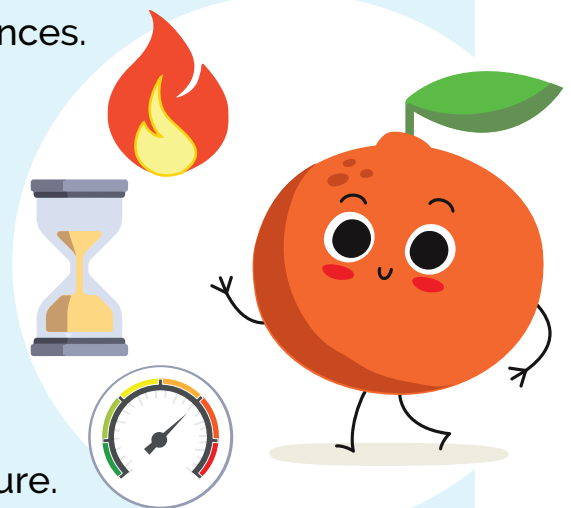
2. Time

The time needed to distill a substance can range from a couple hours to over a day.

3. Pressure

Different materials require different levels of pressure.

Higher pressure means faster distillation. This saves time and money, but also requires careful monitoring, so the substance is not ruined.



From Soil to Oil: The 3 Methods



Memory Game

Do you remember the 3 main types of distillation dōTERRA® uses? Circle them!

steam distillation

vacuum distillation

expression

phytonic process

carbon dioxide extraction

enfleurage

solvent extraction

fractional distillation

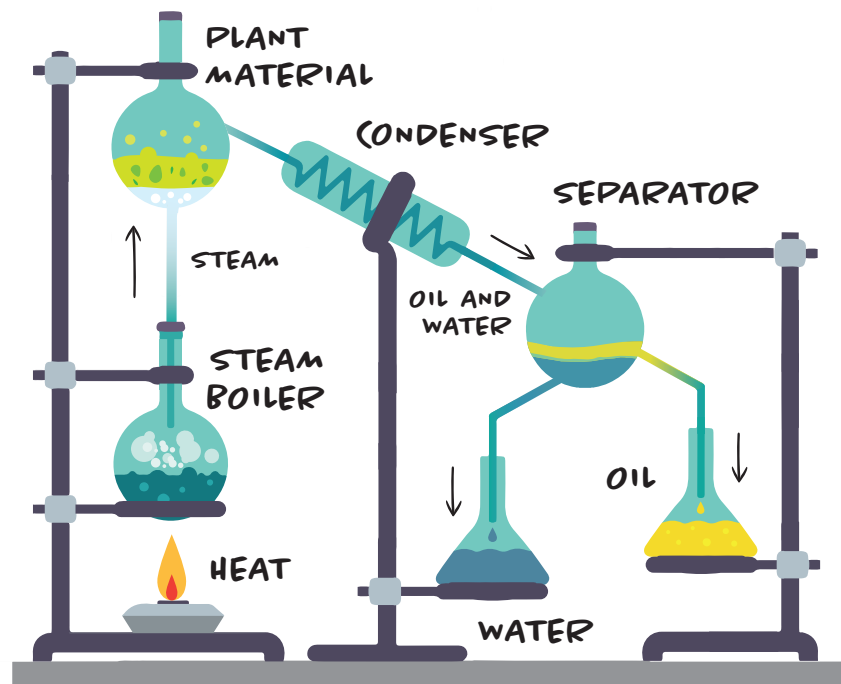
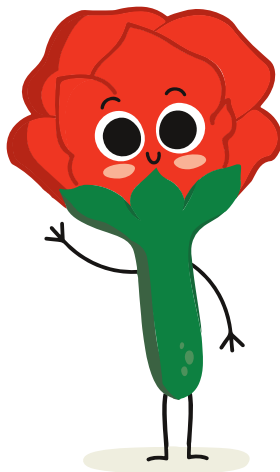
percolation

Answers: steam distillation, expression, and solvent extraction

1. Steam Distillation

This is the most common method for collecting essential oils. In a special container called a "still," water is heated to create steam. The steam moves through a chamber containing plant material. This causes the essential oil sacs in the plant to burst, releasing the oil. The steam transports the oil into a condensing tube where oil and water collect. Because oil and water don't mix, the essential oil rests on top and is easily separated for bottling.

IT LOOKS LIKE THIS!



2. Expression (Cold Pressing)

This method is used for citrus oils because it preserves the strong citrus scent of the fruit. Inside the expression machinery there are several rotating cylinders with large graters attached (like a giant cheese grater). As fruit is added to the machine, the graters cut up the surface of the fruit causing the essential oil sacs to break open and release oil. Water sprays over the fruit to collect the oil, and the mixture is filtered using a centrifuge. A centrifuge is a machine that rotates at high speed in order to separate different liquids or solids from each other.

Test it Out!

- Remove the peel from an orange.
- Bend it between both hands so that the peel breaks.
- Notice a light mist come out of the peel.
- That is the essential oil!



3. Solvent Extraction

This is a little more complicated than the other two methods we've discussed, but it makes it possible to obtain oil from extremely delicate plants, like jasmine flowers. Oil obtained through solvent extraction is different than other essential oils and has a special name: absolute.



In solvent extraction, plant material is placed in a tray and washed with a special solvent. A solvent is a liquid that can dissolve other substances, such as lipids found in oils. The solvent is carefully selected to make sure that it does not change the aroma or properties of the absolute. The mixture is then filtered to remove the plant material which makes a thick, waxy substance called a concrete. A second solvent is used to separate the absolute from the concrete. The second solvent is then removed, leaving behind a pure absolute. dōTERRA uses this method with only a few oils, such as Vanilla and Jasmine.

Test it Out!

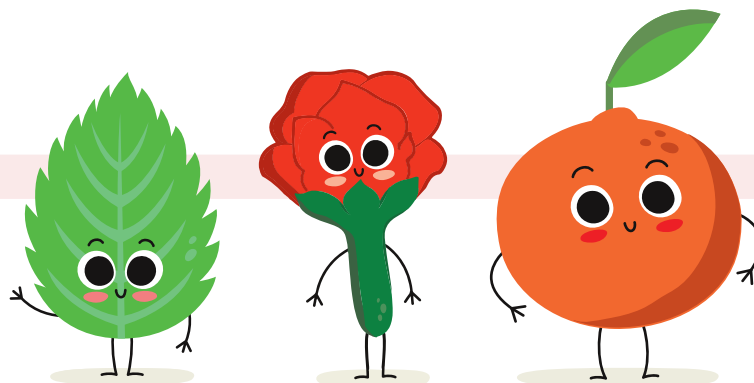
I LOVE PLANTS.

- Find a container.
- Place rose petals, a split vanilla bean, or herbs inside.
- Add some Fractionated Coconut Oil to the plant material.
- Allow the plant material to soak for several weeks or months.
- Gently shake the container every few days to keep the mixture even.
- Keep the container out of direct sunlight and away from high heat.
- The resulting mixture is your own fragrance!



Draw Something!

What is your favorite plant? Draw it in the box.



Distillation Experiment

What You'll Need:

- 1 large glass bowl
- 1 small glass container (shorter than large glass bowl)
- plastic wrap
- a stone
- water
- something to contaminate your water (dye, salt, glitter, etc.)



What You'll Do:

NOTE: If it is not sunny enough outside to complete this experiment, you can microwave the large bowl of water for 2-3 minutes, before adding the small bowl and dye, glitter, etc. This will create steam and allow the clean water to separate from the dirty water. Use caution and have a parent help with handling hot materials.

1

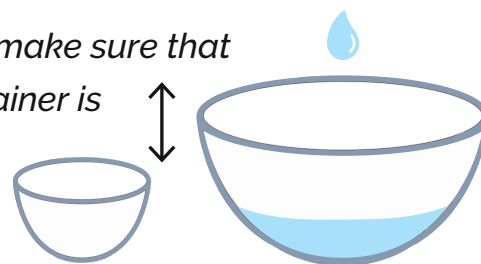
Before beginning this experiment, take a moment to answer question 1 on your "What You Discovered" worksheet. Also, be sure to get a parent's help and permission before gathering the supplies for this experiment.



2

To start, fill the large bowl about 1/3 of the way with water.

NOTE: During this step, make sure that the rim of your small container is not higher than the rim of your large bowl.

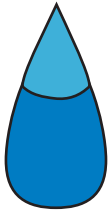


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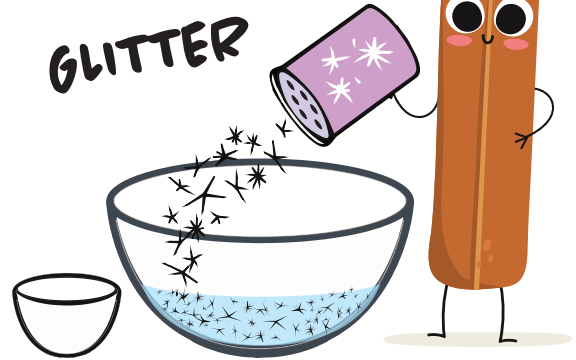
Contaminate your water! Add food dye, salt, glitter, or any substance you would like to make the water dirty. Once you are finished, place the smaller glass in the middle of the bowl and place the plastic wrap tightly over the large bowl.

TRY NOT
TO SPILL

FOOD
DYE

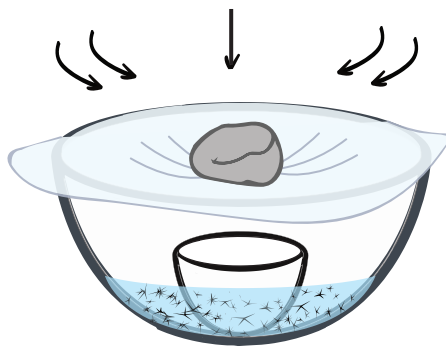
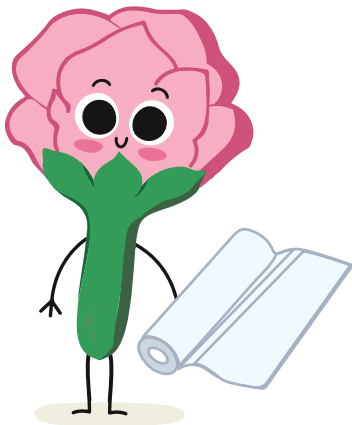


GLITTER



4

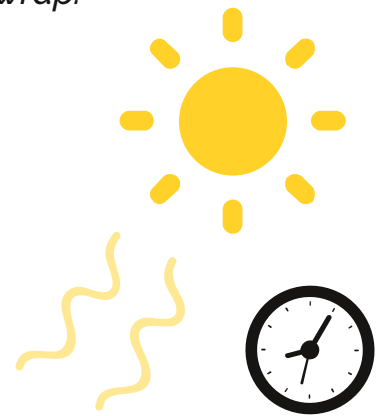
Next, place the stone on top of the plastic wrap directly above the small glass. Make sure the plastic wrap is not touching the rim of the small glass.



NOTE: Make sure that the stones are heavy enough to create a slight downward slope in the center of the plastic wrap.

5

Put the bowl in an area that gets a lot of sunlight. Let the bowl sit for at least an hour in sunlight before checking it. Then check every 30 minutes. As you watch what happens, answer questions 2 and 3 on your "What You Discovered" worksheet.

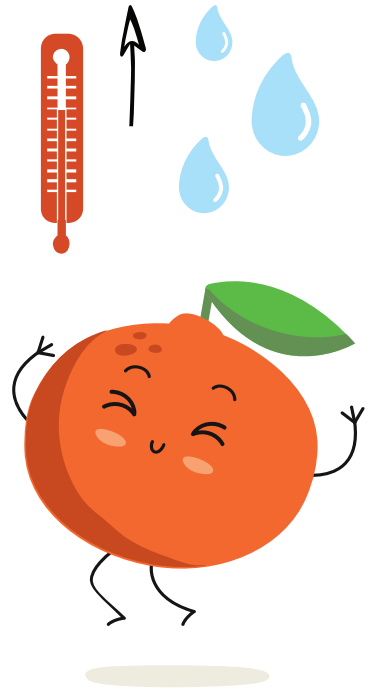


6

Take a moment to finish your "What You Discovered" worksheet. Don't forget to share your findings with family and friends!

What Does It Mean?

As the temperature inside the bowl gets warmer, the water evaporates and rises as a vapor until it hits the plastic wrap. Next, the water condenses and runs down into the glass. The water in the glass should be clear, pure water. This is because you simulated a steam distillation process. The high temperatures allowed the water to separate from the substance you used to contaminate your water and collect in the empty glass.



What To Do Next:

WWW.DOTERRA.COM/BLOG-SCIENCE

1

Repeat this experiment with a different contaminant. For instance, if you used glitter the first time, try the experiment again with food dye. Do the results change?

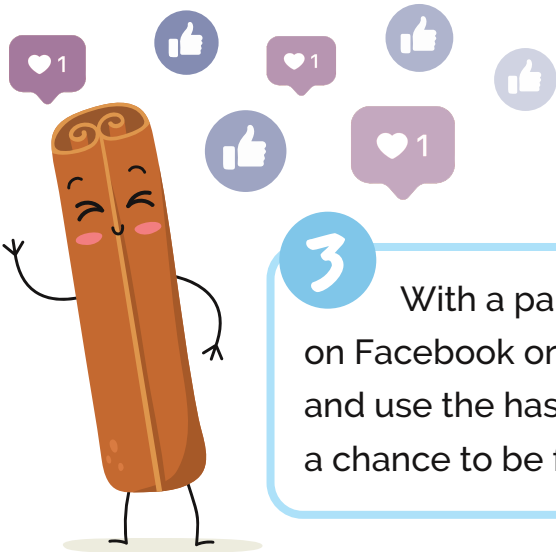


2

Revisit the dōTERRA® Science for Kids tab on the dōTERRA Science Blog for more fun science experiments and activities.

3

With a parent's permission, post a picture of your experiment on Facebook or Instagram. Make sure to tag us @doterrascience and use the hashtags #doterrascienceforkids and #featureme for a chance to be featured on the dōTERRA Science Facebook page.



WE CAN'T WAIT TO
SEE YOUR EXPERIMENT!

What You Discovered

1. Before you begin the experiment, review the “Distillation” module.

2. What can the distillation process be used for?

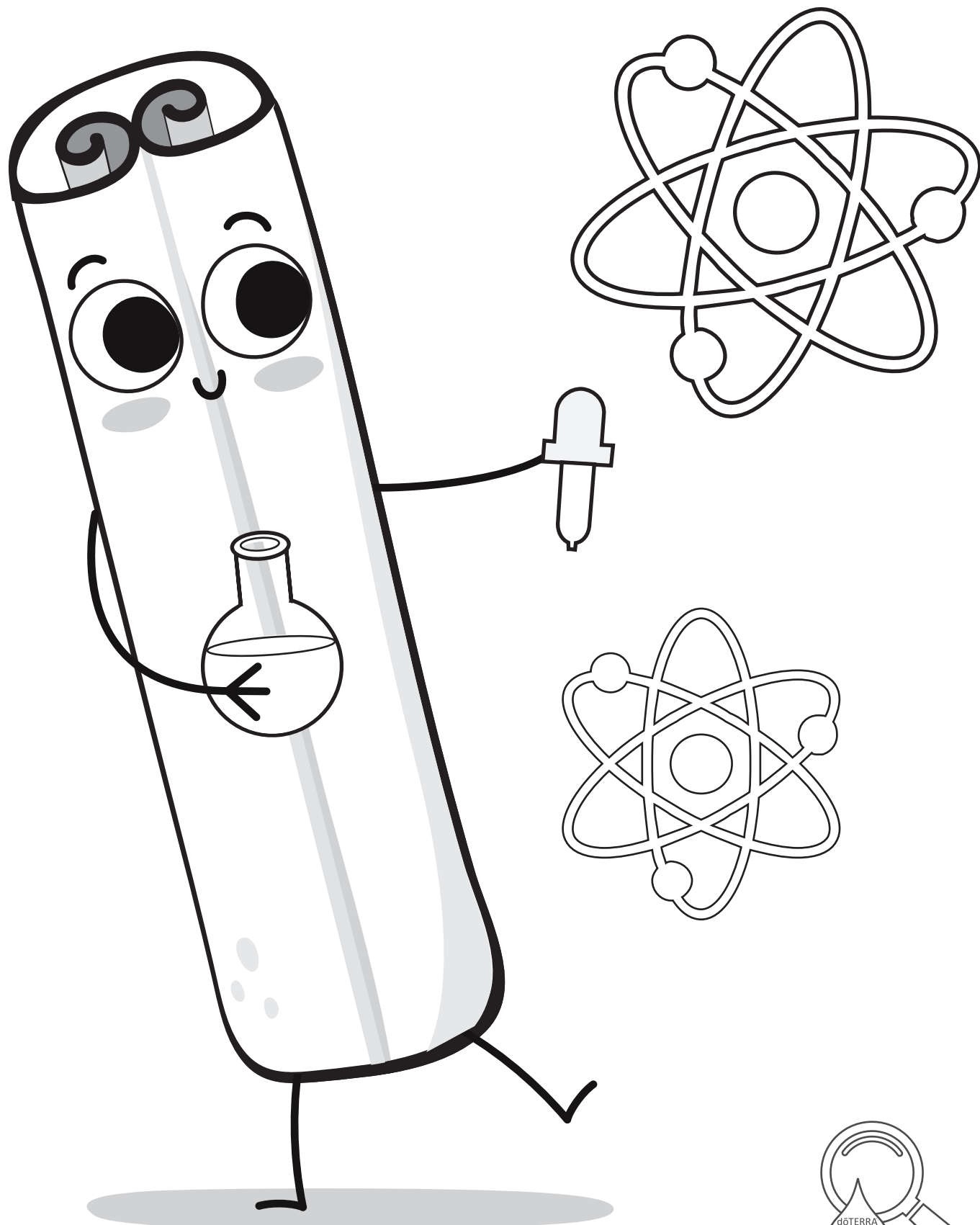
3. **Temperature, pressure, and time** can all affect distillation.
Which factors are involved in this experiment?

4. After an hour or so, observe the bowl.
What do you see happening to the water?

5. Identify which method of distillation this experiment used.

6. What other items do you use that could possibly be distilled?
You can look back at the distillation module if you need help coming up with ideas.

Fill in Charlie Cinnamon Stick!



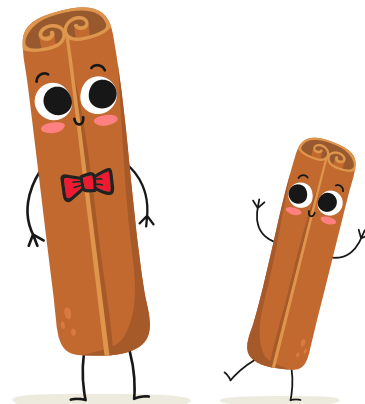
Essential Oil Use and Safety

Safe for the Whole Family

Essential oils are powerful tools that can be used to support health and well-being. When proper usage guidelines are followed, essential oils are safe for the entire family. But for kids, what are those proper usage guidelines? Keep reading to find out!

Adult Supervision

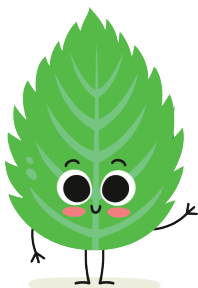
The most important rule for kids when it comes to using essential oils is to always have the help and supervision of an adult. Before using any essential oil, even if it's one you've used before, make sure to talk to an adult about using the essential oil first.



Dosage

Dosage, which is how much of an essential oil you use at once, is a big part of using oils safely. Essential oils are concentrated plant extracts. If too much oil is used, they can cause your body to react negatively. There are many things to consider when choosing the dosage of an essential oil such as your age, weight, overall health, activity level, application method, and the type of oil being used. This makes it hard to find the correct dose for everyone.

To be safe, start with one drop of an essential oil. From there, you and your parent can decide if the oil had the effect you wanted or if you need a second drop. Using small amounts multiple times a day is better than using a huge amount once a day.



How do you make sure that you're using the right dosage?

What factors do you need to remember when determining dosage?

Application Methods

Another important factor is how you apply the oil. There are three ways you can apply essential oils: aromatically, topically, and internally. Choosing the right application method is important so that you can get the benefit you want from the oil.

AROMATIC USE

Aromatic use is when you breathe in an essential oil. This can be done by opening the bottle and inhaling the aroma or by placing a few drops of an essential oil into a diffuser. Using an essential oil aromatically allows you to enjoy the smell of an essential oil while also influencing your emotions and promoting well-being.

TOPICAL USE

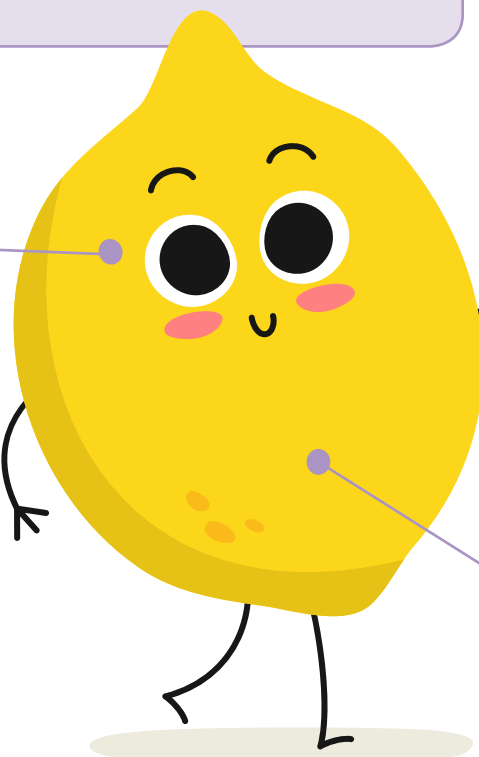
Topical application is used when you want the oil to impact a specific area. For instance, if your skin is feeling irritated, you may want to apply a soothing essential oil, like Lavender, directly to that spot. Remember to always dilute with carrier oil before applying topically.

SENSITIVE AREAS

When using an oil topically, do not apply oils to sensitive areas, such as your eyes or ears. Always wash your hands after applying oils so that you don't accidentally get oils in one of these sensitive areas.

INTERNAL USE

Internal application is when you swallow essential oils. You can do this by taking a capsule, cooking with essential oils, or adding essential oils to water or juice. Taking an oil internally allows the oil to enter directly into the bloodstream. Never use an essential oil internally without adult permission and supervision.



Dilution

Because essential oils are so concentrated, mixing an essential oil with a carrier oil, like Fractionated Coconut Oil, decreases the concentration. This is called dilution. Dilution helps protect your skin by reducing the risk for skin irritation while also helping your skin absorb the oil better.



Why is dilution so important? When should you dilute?

Picking the Correct Oils

Before using essential oils it's important to pick the correct essential oils. Some oils are mild, while others are strong. As a kid, your skin tends to be more sensitive than an adult's skin, so using milder oils, such as Lavender, Melaleuca, or Frankincense, is a good idea. Avoid using stronger oils like Oregano and Lemongrass.

Also, make sure to read the oil label before applying it. Some oils can cause your skin to be extra sensitive to sunlight when applied topically, so make sure you know if there are any cautions on the oil label that you need to be aware of.



Essential Oil Testing

dōTERRA® essential oils are thoroughly tested, verifying that they are the best essential oils available before they are labeled CPTG Certified Pure Therapeutic Grade® essential oils.

There are a lot of different tests essential oils can go through. The tests conducted by the expert scientists in dōTERRA's labs ensure that each bottle of essential oil is the best nature has to offer. When you use a bottle of essential oil labeled CPTG Certified Pure Therapeutic Grade, you use an essential oil that has been thoroughly tested to guarantee its safety and effectiveness.



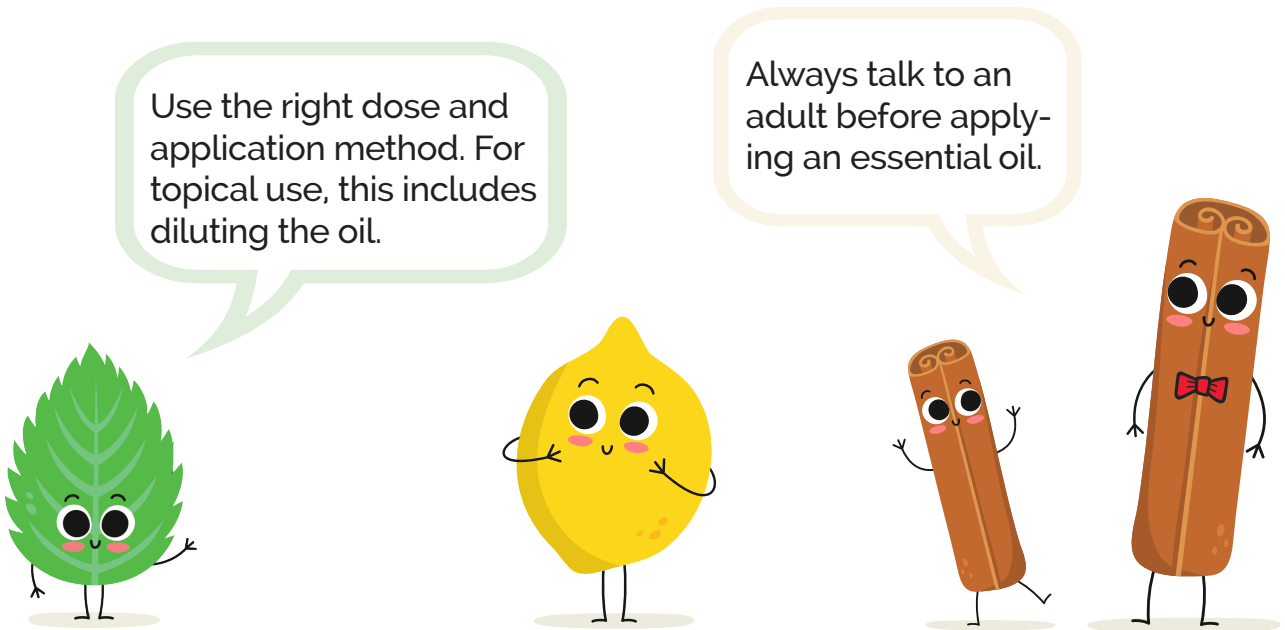
There are a lot of different tests essential oils can go through.

Some of these tests are...

- Gas Chromatography/Mass Spectrometry (GC/MS)
- Fourier Transform Infrared Spectroscopy (FTIR)
- Microbial Testing
- Specific Gravity
- Organoleptic Testing

Points to Remember

When it comes to using essential oils, the entire family can benefit. However, you need to ensure that you're using proper usage guidelines. Remember, essential oils can be amazing tools for supporting your well-being, but you have to be certain that you're using them safely and correctly in order to benefit from their properties.



What is your favorite essential oil to use aromatically?

How do you like to use oils topically?

Why do you need to be careful when using an essential oil internally?

Use and Safety Crossword

1

2

3

4

5

6

7

8

9

10

Down

1. Using small amounts of essential oil _____ times a day is better than using a large amount once a day.
2. Dilution helps lessen the _____ of an essential oil.
3. _____ use is when you breathe in an essential oil.
5. _____ is how much essential oil you use at once.

Across

3. You should always have _____ supervision before using essential oils.
4. Start with one _____ when using an essential oil and then decide with your parents if that amount needs to be adjusted.
6. This mild essential oil comes from a purple flower, and soothes and calms the skin.
7. This type of essential oil use involves applying essential oil to your skin.
8. Adding essential oils to food is an example of this type of essential oil use.
9. When using essential oils avoid applying them to _____ areas.
10. The three application methods are: topically, _____, and aromatically.

Essential Oil Tips for Kids



Aromatic Use

Only use essential oils with the permission and supervision of your parents or another responsible adult.

- Apply a drop or two of Wild Orange or another favorite citrus essential oil to diffuser jewelry to uplift mood. Check out the dōTERRA® Product Blog for ways to make your own jewelry.
- Dispense a bit of the InTune® Focus Blend to your shirt collar before taking a test or when working on homework.
- Place a drop of Lavender essential oil on your pillow or a favorite stuffed animal to help you unwind before falling asleep.
- Combine a few drops of your favorite essential oils in a diffuser to make your own blend.
- Place a drop or two of your favorite essential oil on a cotton ball and stick it in your shoes to help eliminate stinky smells.



Topical Use

Before using an essential oil topically, make sure to dilute it using a carrier oil like Fractionated Coconut Oil.

- Apply dōTERRA Serenity® Restful Blend to the bottoms of your feet to promote a restful sleeping environment.
- Apply DigestZen® Touch to your tummy when your stomach feels upset.
- Apply TerraShield® to your legs, arms, and neck before hiking or playing outside.
- Rub your favorite dōTERRA Emotional Aromatherapy® Touch Oil on your temples or over your heart to provide emotional support.
- Apply dōTERRA Breathe® Touch to your chest when seasonal or environmental threats are high.



Internal Use

The internal use of essential oils is a personal decision. While essential oils can add to the flavor of a recipe, they are an optional addition.

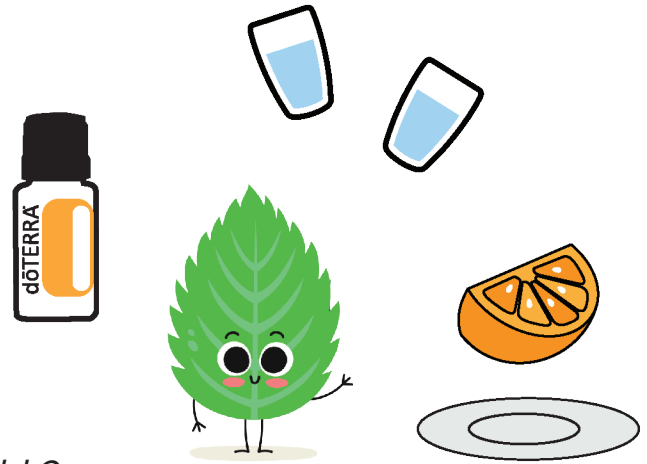
- With the help of a parent or another responsible adult, try adding essential oils to some of your favorite recipes. Check out the dōTERRA® Product Blog or the nutrition modules in the dōTERRA Science for Kids section of the dōTERRA Science Blog for ideas of recipes to try.

Organoleptic Testing

Organoleptic testing is one of many tests dōTERRA conducts to make sure each bottle of essential oil is safe and effective for use. This test uses the senses to make sure essential oils look, smell, feel, and taste the way they're supposed to. Complete the activity below and do some organoleptic testing of your own!

What You'll Need:

- 2 glasses of water
- A plate
- An orange, cut into slices
- Wild Orange essential oil



NOTE: Ask an adult for permission to use the Wild Orange essential oil. An adult can also help cut the orange into slices.

What You'll Do:

In this experiment, you will discover the differences between Wild Orange essential oil and an orange. Before we start, make some predictions below.

MY PREDICTIONS

- 1 Will the Wild Orange essential oil smell the same as or different than the fruit?
- 2 Which will taste better, the fruit or the essential oil?
- 3 What will happen when you put an orange slice in water? What about the essential oil?



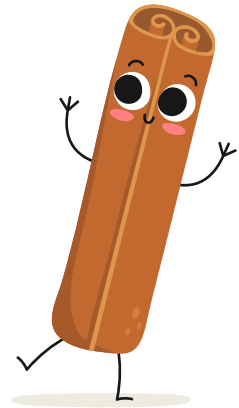
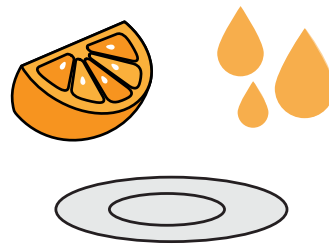
Once you've written down your predictions, open the bottle of Wild Orange essential oil and smell the oil. Then pick up an orange slice and smell it.

- 4 What does the Wild Orange essential oil smell like? Is it sweet? Sour? Strong?
- 5 What does the orange fruit smell like?
- 6 Compare the scent of both the fruit and the essential oil. How were they the same? How were they different? Which smell did you like better?



Next, put a couple of drops of Wild Orange essential oil on the plate. Put an orange slice on the plate next to the drops.

NOTE: Because Wild Orange is a citrus oil, it can potentially break down plastics, so you'll want to use a ceramic or paper plate that won't be affected by the oil.



- 7 What is the color of the Wild Orange essential oil?
- 8 What is the color of the orange fruit?
- 9 How do the colors of both the fruit and the essential oil compare? Which is brighter? Lighter? Darker? Duller?





Next, use your hands to touch the fruit and the oil and notice what they feel like.

10

What is the texture of the fruit? Is it bumpy? Smooth? Soft? Hard?

11

What is the texture of the essential oil? Is it dry? Wet? Liquid? Solid?



Now take a bite of the orange and notice its flavor. Place a drop or two of Wild Orange essential oil in one of your glasses of water and mix it in. Have an adult help you add the correct portion to the water. Now sip the water and pay attention to how it tastes.

NOTE: *Using essential oils internally is a personal decision. If you would rather not drink essential oil you can skip this portion of the experiment.*



12

Describe the flavor of the orange slice. Is it sweet? Bitter? Sour?

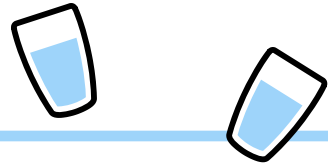
13

Describe the flavor of the Wild Orange essential oil. Is it sweet? Bitter? Sour?

14

Compare the flavors of the fruit and the essential oil. Which tasted better? Which was sweeter? Which was most sour?





In one glass of water, place a drop or two of essential oil. Allow it to settle for a few minutes and watch what happens. After you're done observing the oil in the water, place an orange slice in the water. Give it a few seconds to settle and notice what happens.

15

When you put the essential oil in water, what happened? Did the oil sink or float? Did it mix into the water or stay separated?

15

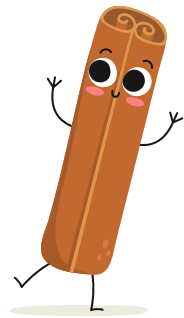
16

When you put the orange slice in water, what happened? Did the orange slice sink or float?

16



SCIENCE IS FUN!



Once you've finished recording all of your observations, take a moment to look over your findings. How do they compare to your predictions? Write a few sentences about the similarities and differences you were able to observe between Wild Orange essential oil and the orange fruit.

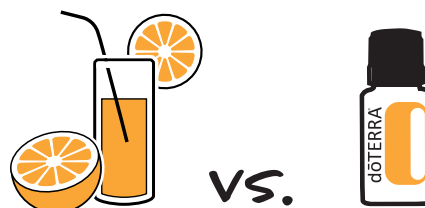
What Does It Mean?

Good scientists make careful observations using their senses and record these observations in order to learn how the world works. When it comes to essential oil testing, this careful observation actually has a name: organoleptic testing. This allows scientists to check the quality of essential oil through taste, sight, touch, and smell to make sure that each essential oil is the best oil available.

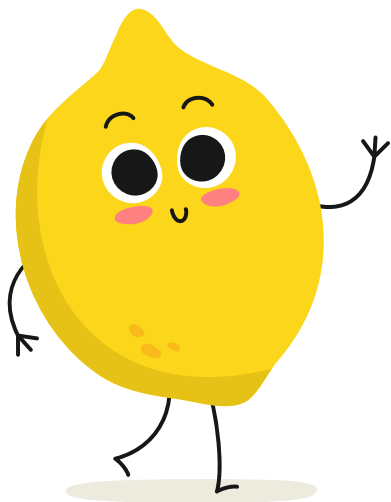
For this experiment, you were able to try a bit of organoleptic testing while also comparing an essential oil and to the plant it comes from. It's amazing to experience just how similar and different plants and essential oils can be. Aren't senses wonderful?

What to Do Next:

Compare Wild Orange essential oil and the actual fruit to orange juice.

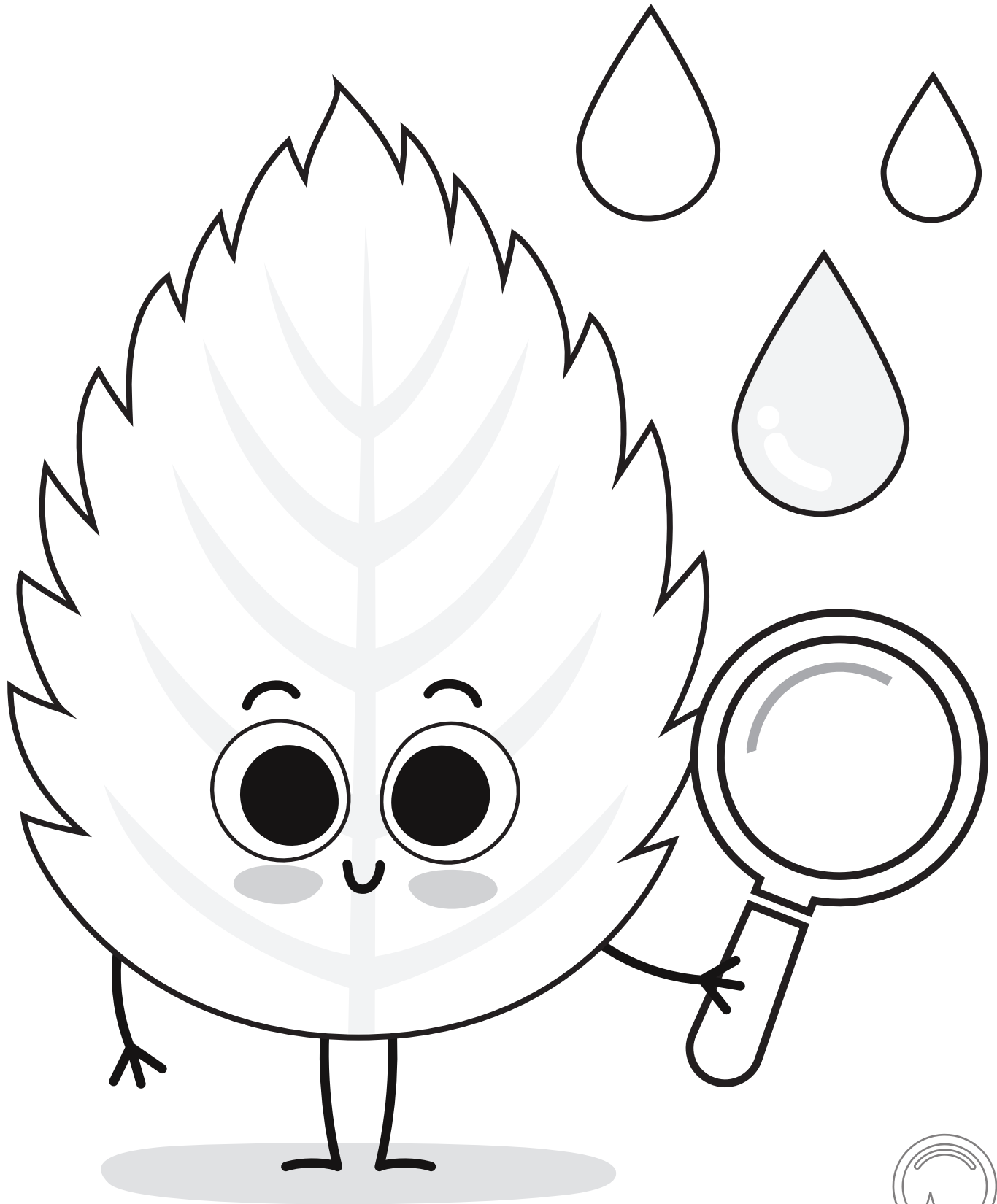


Complete the same experiment for Lemon or Lime essential oils.

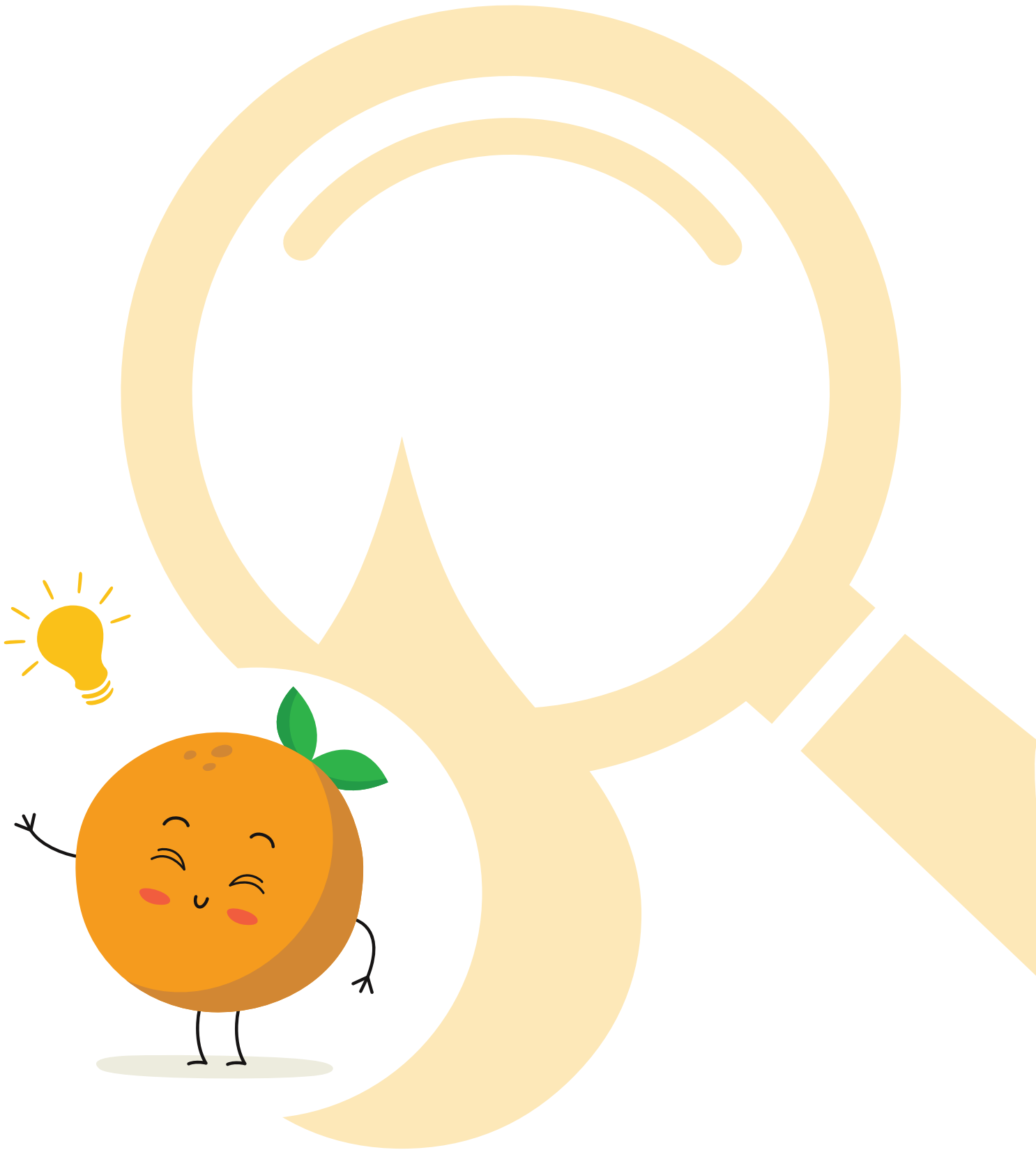


With a parent's permission, post a picture of your experiment on Facebook or Instagram. Make sure to tag us at @doterrascience or use the hashtags #doterrascienceforkids and #featureme for a chance to be featured on the dōTERRA® Science Facebook page.

Make Perry Peppermint green!



Want more Science fun?



Try these additional activities.



Essential Oils & Emotions Experiment

1. Emotions are an important part of daily life. In this experiment, you will track your emotions over the course of a week and find ways to handle them in an appropriate, healthy manner. To start, take a moment to answer questions 1-3 on your "What You Discovered" worksheet.
2. Record how you are currently feeling, the date, and time in the boxes next to day 1 of the Emotion Tracking Log.
3. Take a moment to consider how you're feeling and determine what is causing the emotion. For example, you may be feeling excited because you like doing science-related activities.
4. As you continue to think about the emotion, take time to determine if it is one you want to keep or one that you want to change. For example, if you are feeling happy, you probably want to continue feeling happy. However, if you are feeling sad, you may want to take steps to change that emotion.
5. Next, write how you addressed your emotion. If it is an emotion that you want to maintain, such as happiness, write down what you did to maintain that emotion. If the emotion is one that needs to be adjusted, such as anger or frustration, record what you did to address the emotion. There are many different ways to change an emotion.

Below is a list of a few options, though there are many other methods that you can also use.

- i. Look at the dōTERRA Emotional Aromatherapy® Wheel and decide which dōTERRA Emotional Aromatherapy Blend can help you address your emotion. Remember that if you want to diffuse the oil, using the normal blend is a good idea, but if you want to apply the oil to your skin, you may want to use the dōTERRA Emotional Aromatherapy Touch oil blends.
- ii. Talk to someone about your feelings.
- iii. Go for a walk.
- iv. Take five deep breaths.

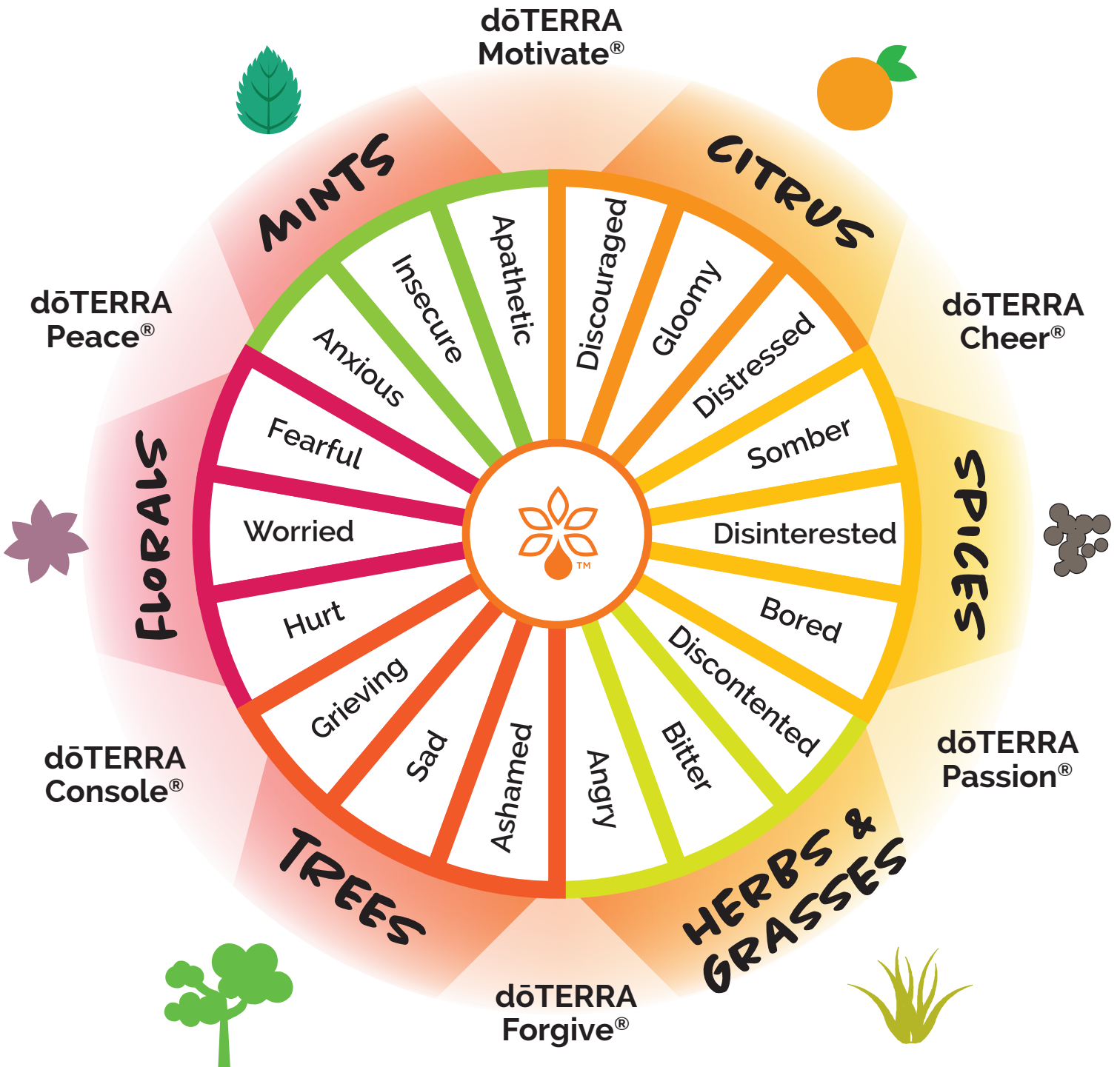
6. After you have addressed your emotion, take a moment to write down how you are feeling now. Are you still sad or do you feel happy? Are you still frustrated or do you feel relaxed?
7. Repeat these steps each day for a week. As you address your emotions, consider trying different ways of changing your emotions. For example, one day you may try diffusing dōTERRA Console® when you're feeling sad, while on another day you may go for a short walk.
8. Consider your results by taking time to fill out questions 4-8 on the worksheet.

What You Discovered

We all feel emotions. Our feelings play an important role in our daily lives. They determine our attitude and how we handle different situations. Understanding our emotions, what we feel, and why we have a certain feeling is key to living a healthy life. Taking time to document emotions and think through our response to them allows us to consider how we respond and react to different situations and how we can best handle challenges in life.

- 1.** Write down which emotions you feel most often. Do you think you are happy most of the time or sad?
- 2.** Do you think there is a pattern of emotion that you'll see as you create your log? For example, you may find that when you write down your emotions in the morning you are usually tired and maybe grumpy, but if you write down your emotions in the afternoon you are usually happy or excited.
- 3.** How do you currently handle your different emotions?
- 4.** How does your finished log compare to your predictions from question 1?
- 5.** How have you changed how you address the emotions you want to change?
- 6.** What worked the best for you to manage your feelings?
- 7.** Which essential oils worked the best for you as you tried to change your emotions?
- 8.** As you recorded your emotions over the last week, what did you learn about your emotions? Take a moment to write your thoughts and what you learned through this experience.

dōTERRA EMOTIONAL AROMATHERAPY® WHEEL





Emotions Tracking Log

DAY 1

date

time

DAY 2

date

time

DAY 3

date

time

DAY 4

date

time

DAY 5

date

time

DAY 6

date

time

DAY 7

date

time

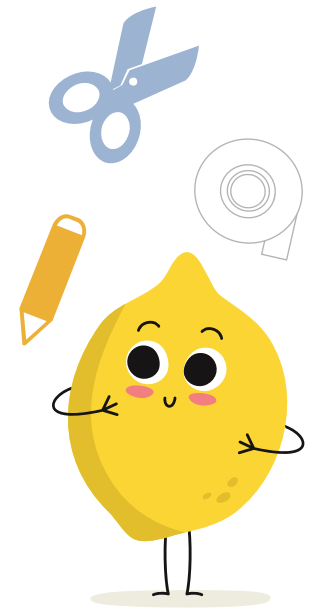
What To Do Next:

- ✓ Continue to consider your emotions and find healthy, constructive ways to address them.
- ✓ With your parent's permission, share your favorite way to use dōTERRA Emotional Aromatherapy® oils to address your emotions online and tag #doterrascienceforkids.
- ✓ Check out more Science for Kids units on the dōTERRA® Science Blog.

Essential Oil Aromas

What You'll Need:

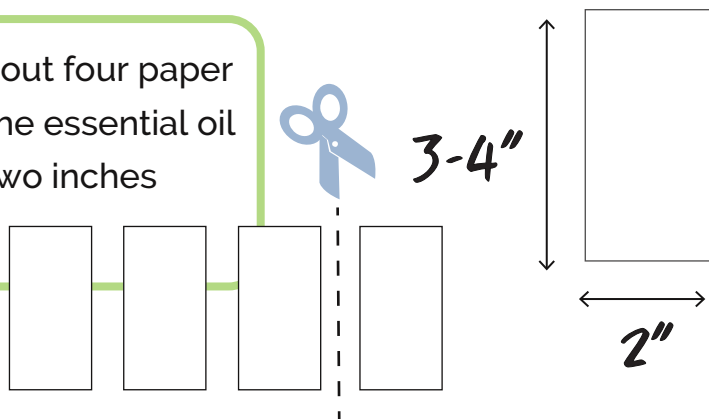
- Lemon essential oil
- Lime essential oil
- Grapefruit essential oil
- Wild Orange essential oil
- A sheet of paper
- Scissors
- Tape
- A pencil or pen
- A friend
- Your nose



What You'll Do:

1

From your sheet of paper, cut out four paper strips that are big enough to cover the essential oil bottle label. They should be about two inches wide and three to four inches long.

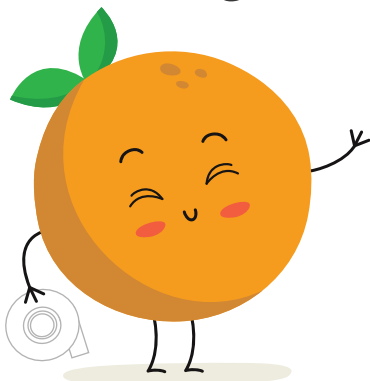


ARE YOUR LABELS BIG ENOUGH?



2

Tape a strip of paper over the label of each oil bottle. Make sure to cover the label completely, so that you can't tell which oil is which.



3

Have a friend mix up the oil bottles and number them 1 through 4 on the strips of paper.

NOTE: If your essential oil bottles have cap stickers then your friend will also need to remove the caps or tape a piece of paper over the cap so that you don't know which oil is which.



4

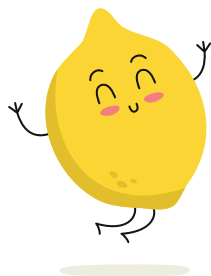
Smell each essential oil one by one and write down your guess as to which oil is which on questions 1 through 4 on your "What You Discovered" worksheet.

1. LEMON



5

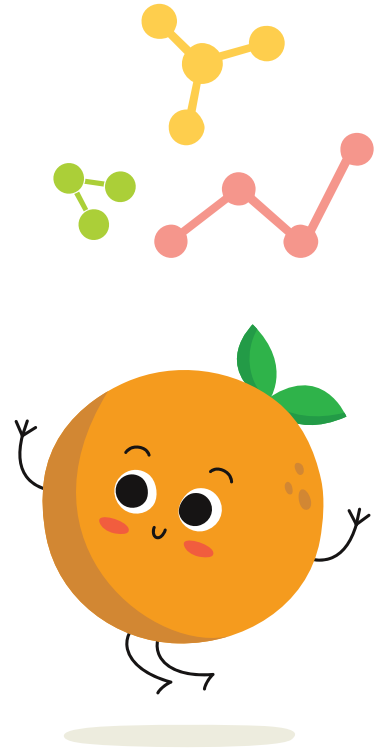
After you've written down your guesses, remove the paper strips and answer questions 5 through 8 on your "What You Discovered" worksheet.



HOW MANY DID YOU GUESS CORRECTLY?

What Does It Mean?

Different molecules make up each essential oil, giving them their unique aroma. However, some essential oils have similar chemical makeup (kind of like two recipes with similar ingredients), which can make it difficult to tell the difference between essential oils. Your sense of smell is one of five senses you possess, and it helps you make sense of the world around you by helping you experience aromas. However, sometimes your nose can get confused when two things smell similar, which makes guessing essential oil aromas interesting and fun.



What To Do Next:

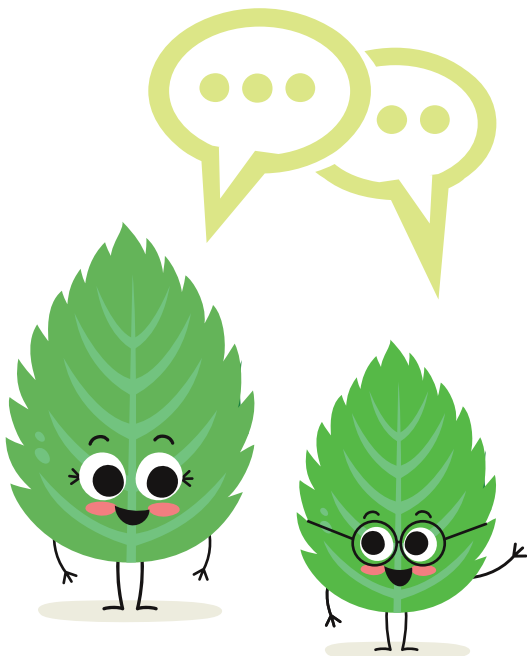
1

Repeat the experiment, but use a different category of essential oil. You could use wood oils, mint oils, or herb oils.



2

Repeat the experiment, but have your friend do the guessing this time. See how your results compare.



What You Discovered

1. Which essential oil do you think is oil number one?

2. Which essential oil do you think is oil number two?

3. Which essential oil do you think is oil number three?

4. Which essential oil do you think is oil number four?

5. How many essential oils did you guess right?

6. Was it easy or hard to figure out which essential oil was which?

7. Which two oils smelled the most similar to you?

8. Which essential oil do you think smells best?

Essential Oil Word Search

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

TRY TO FIND THESE 20 OILS!

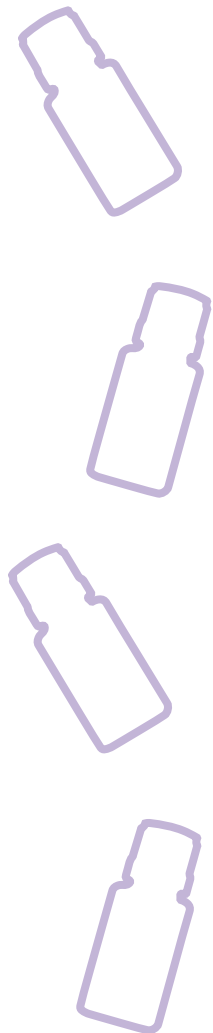
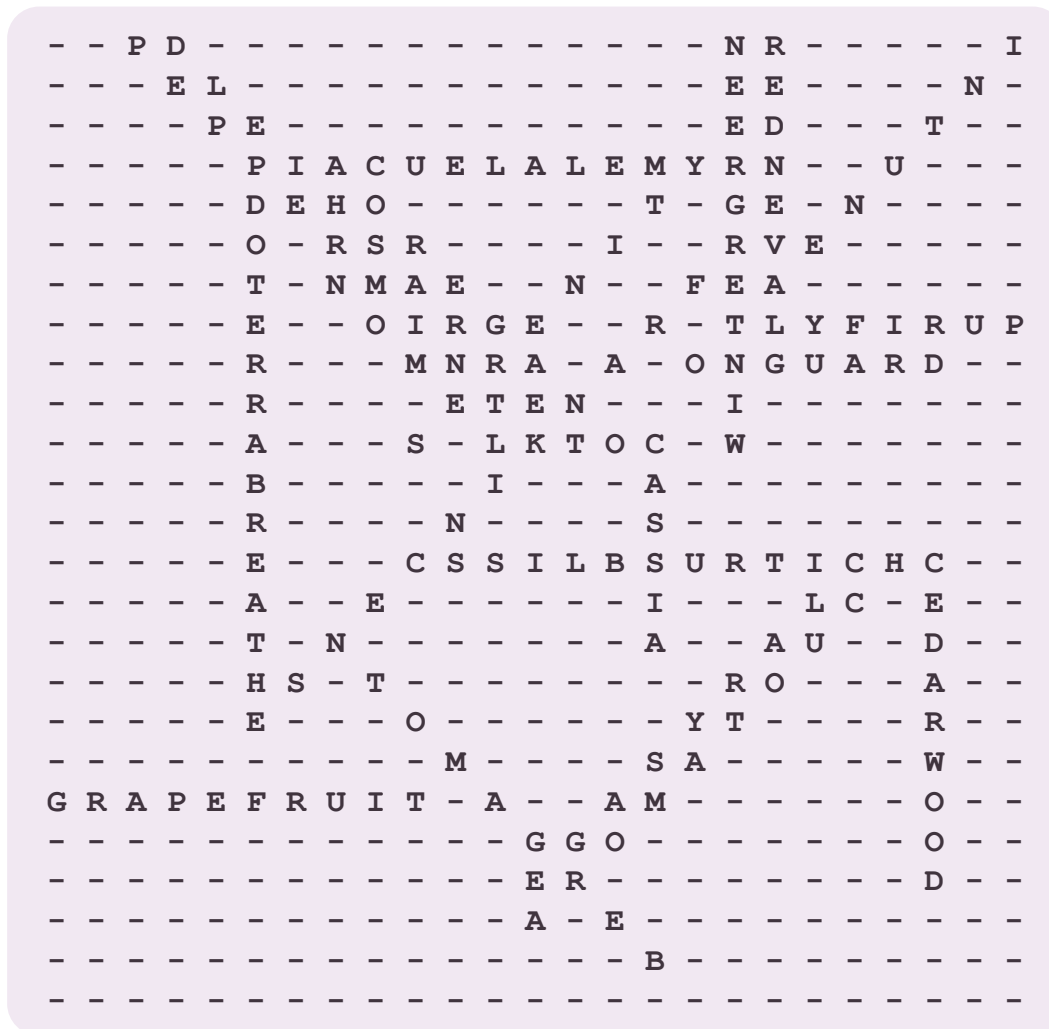


AROMATOUCH
 BERGAMOT
 CASSIA
 CEDARWOOD
 CITRUS BLISS
 CLARY SAGE

DOTERRA BREATHE
 FRANKINCENSE
 GRAPEFRUIT
 INTUNE
 LAVENDER
 LEMON

MELALEUCA
 ONGUARD
 OREGANO
 PEPPERMINT
 PURIFY
 SERENITY
 TERRASHIELD
 WINTERGREEN

ANSWER KEY:



{ OVER, DOWN, DIRECTION }

AROMATOUCH (13, 23, NE)

BERGAMOT (16, 24, NW)

CASSIA (16, 11, S)

CEDARWOOD (23, 14, S)

CITRUSBLISS (21, 14, W)

CLARYSAGE (21, 14, SW)

DOTERRABREATHE (6, 5, S)

FRANKINCENSE (17, 7, SW)

GRAPEFRUIT (1, 20, E)

INTUNE (25, 1, SW)

LAVENDER (19, 8, N)

LEMON (12, 11, NW)

MELALEUCA (16, 4, W)

ONGUARD (17, 9, E)

OREGANO (9, 5, SE)

PEPPERMINT (3, 1, SE)

PURIFY (25, 8, W)

SERENITY (10, 11, NE)

TERRASHIELD (14, 11, NW)

WINTERGREEN (18, 11, N)

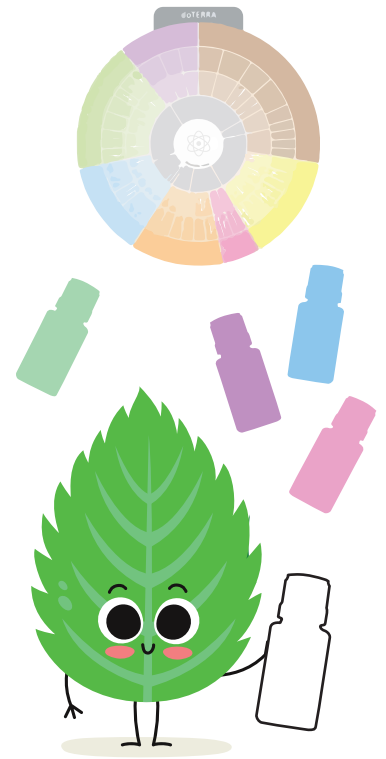


DID YOU FIND THEM ALL?

Create Your Own Blend

What You'll Need:

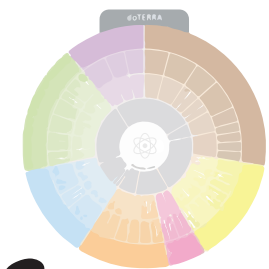
- Various essential oils
- 1 oil bottle
(You can buy a special bottle for your essential oil blend, or you can reuse an empty oil bottle you have on hand)
- Fractionated Coconut Oil (optional)
- A copy of the dōTERRA® Oil Chemistry Wheel
- A sheet of paper



What You'll Do:

1

For this experiment, you will be making your own essential oil blend. First, decide what you want this oil blend to do and how you want to use it. This will answer questions 1 and 2 on your "What You Discovered" worksheet.



2

Once you've determined what you want the oil blend to do, consult the dōTERRA® Oil Chemistry Wheel to get an idea about which essential oils to use. Write down the possible essential oils under question 3 on your "What You Discovered" worksheet.

NOTE: Make sure you talk to a parent or responsible adult before using these essential oils and make sure your oils can all be used for the application method you've picked. For example, if you want to use your blend internally, only use oils that are safe for internal use.



3

Now you get to start making your own essential oil blend! Start by adding the oils you want to use one drop at a time. After each drop, smell the oil blend to determine if you like the aroma or if it needs to be adjusted.



NOTE: If you feel like one drop would be too much of a given oil, you can also add the oil by dipping a toothpick into an essential oil and then stirring it into your blend.

1 drop x 3



4

Once your essential oil blend smells the way you want it to, write down the oils used and the formula (the number of drops of each oil) for your blend on questions 4 and 5 of your "What You Discovered" worksheet.

5

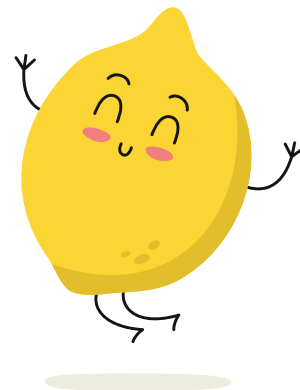
Share your blend with your friends and family and finish your "What You Discovered" worksheet. Make sure to come up with a fun name for your blend (question 7 on your worksheet). Typically the name of a blend will have something to do with the blend's aroma or benefits.

HERE ARE SOME NAMES OF DÖTERRA BLENDS



- dōTERRA Cheer®
- DigestZen®
- dōTERRA Motivate®
- Citrus Bliss®
- dōTERRA Balance®

DID YOU HAVE FUN BEING AN ESSENTIAL OIL SCIENTIST TODAY?



What Does It Mean?

Creating an essential oil blend is a carefully planned out process that involves multiple steps. Scientists carefully consider what the blend is meant to do, how it is supposed to be used, the chemistry of each oil used, and the overall aroma of the blend. With each of these factors in mind, scientists are able to develop essential oil blends that build on the individual essential oils they contain. This enhances the unique characteristics of each essential oil in order to make a uniquely beneficial blend that promotes wellness in a new way.



What To Do Next:

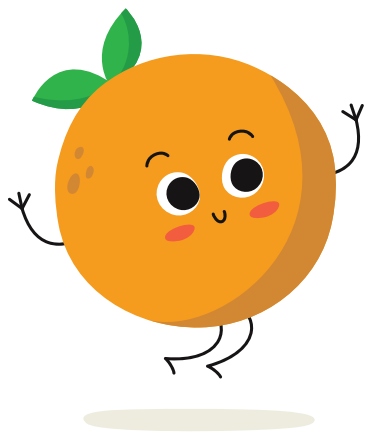
1

Create another essential oil blend with a different usage goal in mind.



2

With a parent's permission, post the recipe for your essential oil blend on Facebook or Instagram. Make sure to tag us **@doterrascience** and use the hashtags **#doterrascienceforkids** and **#featureme** for a chance to be featured on dōTERRA Science.



WWW.DOTERRA.COM/BLOG-SCIENCE



What You Discovered

1. What do you want your essential oil blend to do?

2. How do you want to use your essential oil blend?
Aromatically? Topically? Or internally?

3. Which oils have the chemistry to match the goal(s) of your blend?

4. Which essential oils did you use to make your blend?

5. How much of each oil did you use?

6. Describe the aroma of your essential oil blend.

7. What is the name of your essential oil blend?

Acknowledgments

This workbook was put together by members of the dōTERRA® Science team: Hillary Slaughter (author), Estée Crenshaw (editor/designer) and Ellie Peek (designer). The following images and artwork were used under license from Shutterstock.com:

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