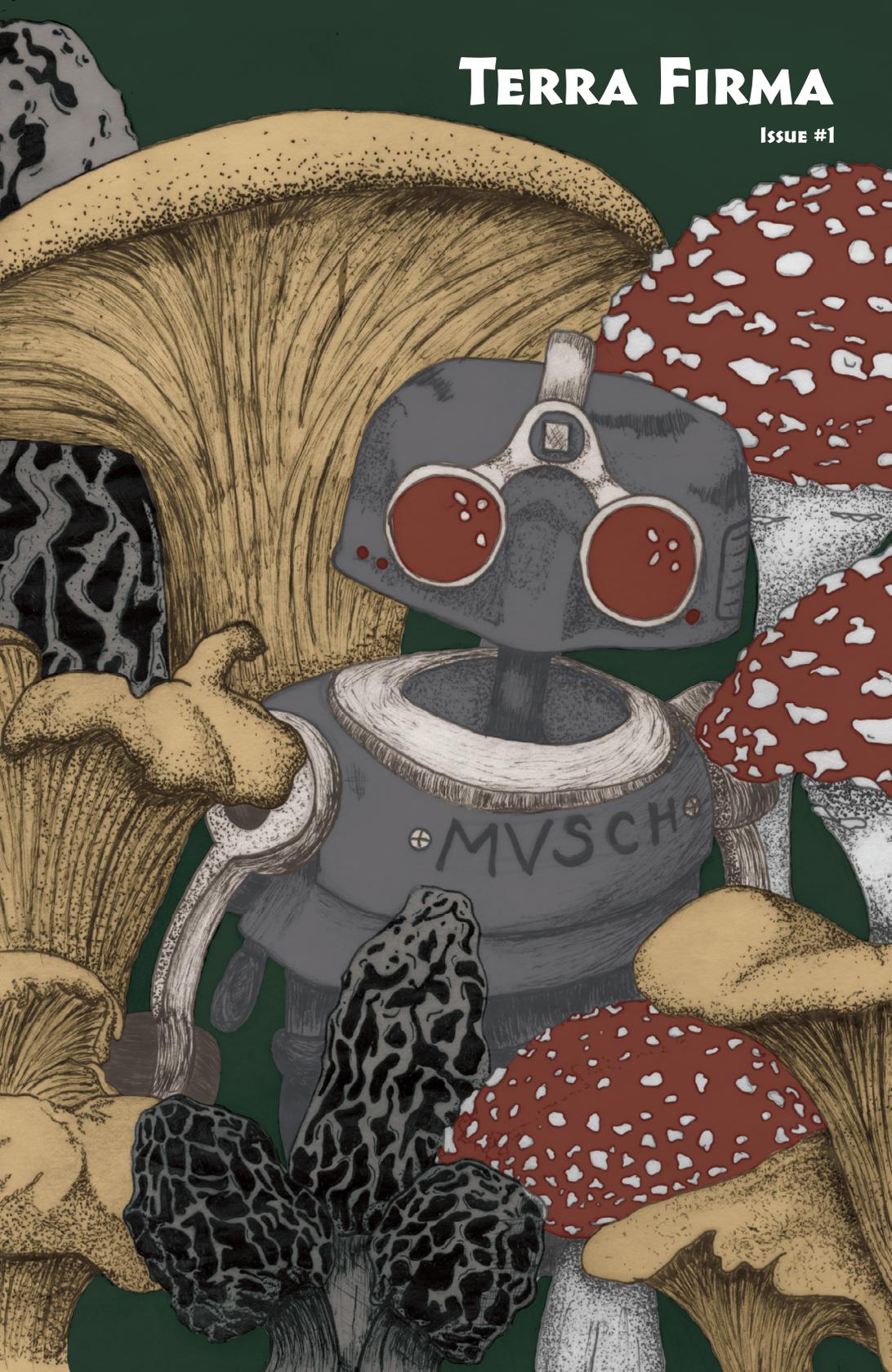


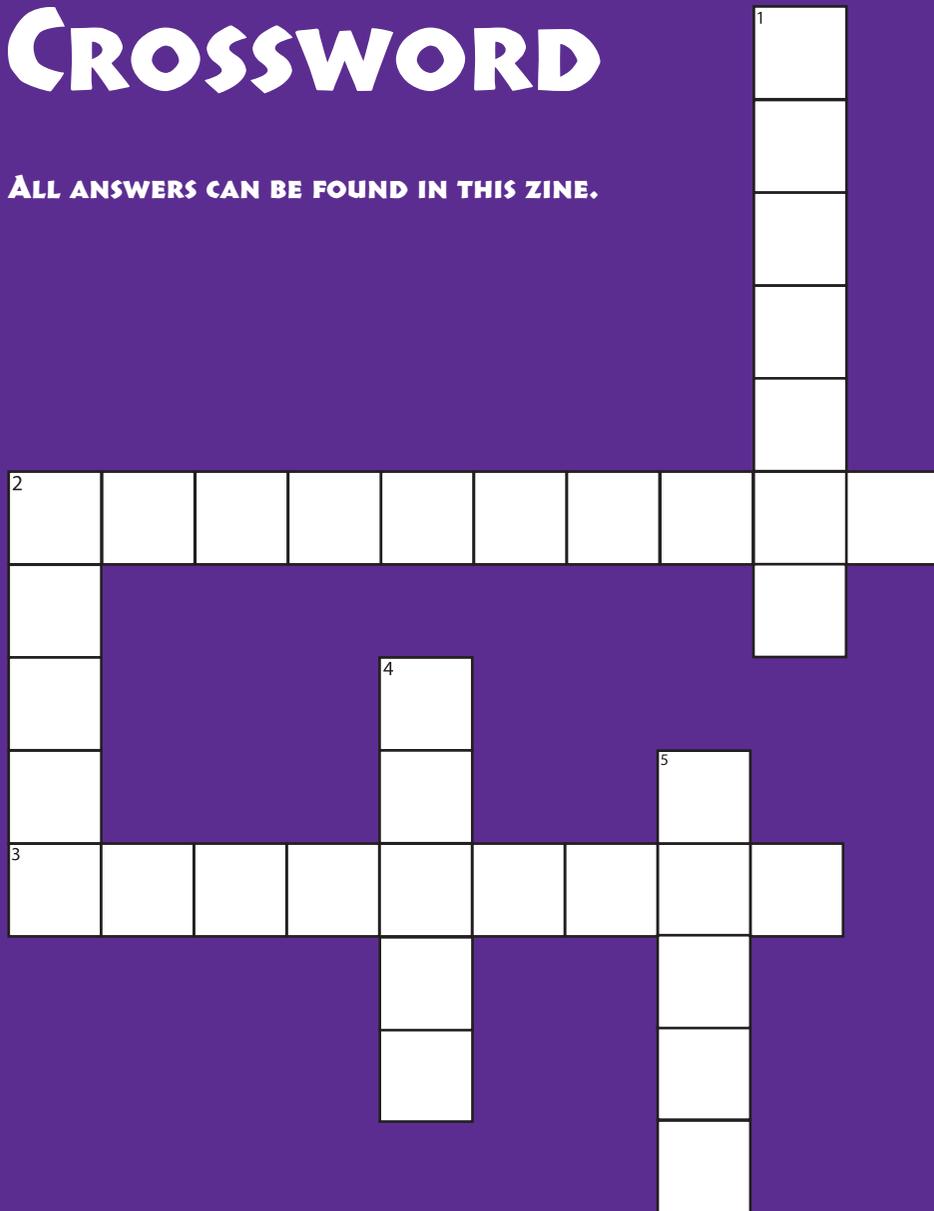
TERRA FIRMA

Issue #1



CROSSWORD

ALL ANSWERS CAN BE FOUND IN THIS ZINE.



1 DOWN - STAR WARS TECHNICAL ILLUSTRATOR.

2 ACROSS - ILLUSTRATIONS OF PLANTS AND ANIMALS

2 DOWN - BUBBLY FOAM CREATED BY ACTIVATED YEAST.

3 ACROSS - 1500 TYPES OF _____ IN THE PNW.

4 DOWN - NUMBER OF CUPS OF FLOUR IN THE PIZZA DOUGH RECIPE

5 DOWN - SPOT IS A _____.



SCIENCE TIK TOKKERS You SHOULD KNOW...

1

@THATNATCHATS, SHE TAKES EVERYDAY ITEMS AND LOOKS AT THEM UNDER THE MICROSCOPE ALONG SIDE COOL MUSIC.

2

@THEPHYSICSGIRL, WOAH PHYSICS, SERIOUSLY INTERESTING

3

@NILERED, INTERESTING CHEMISTRY VIDEOS. WATCH HIM DO SOME IN-LAB EXPERIEMENTS

4

@FASCINATEDBYFUNGI, FIND OUT ABOUT MUSHROOM FORAGING LEARN ABOUT EDIBLE AND POISONOUS MUSHROOMS.

5

@ASTRO_ALEXANDRA, GET YOUR FILL OF ASTRONOMY TALK.

6

@MINISTRYOFSCIENCE TALKS ON A WIDE RANGE OF TOPICS FROM STRING THEORY TO CRYOSLEEP.

7

@NEILDEGRASSETYSON, ASTROPHYSICS ENTERTAINMENT. BECOME A STUDENT OF THE UNIVERSE!



MYCOLOGY:

GETTING TO KNOW MUSHROOMS

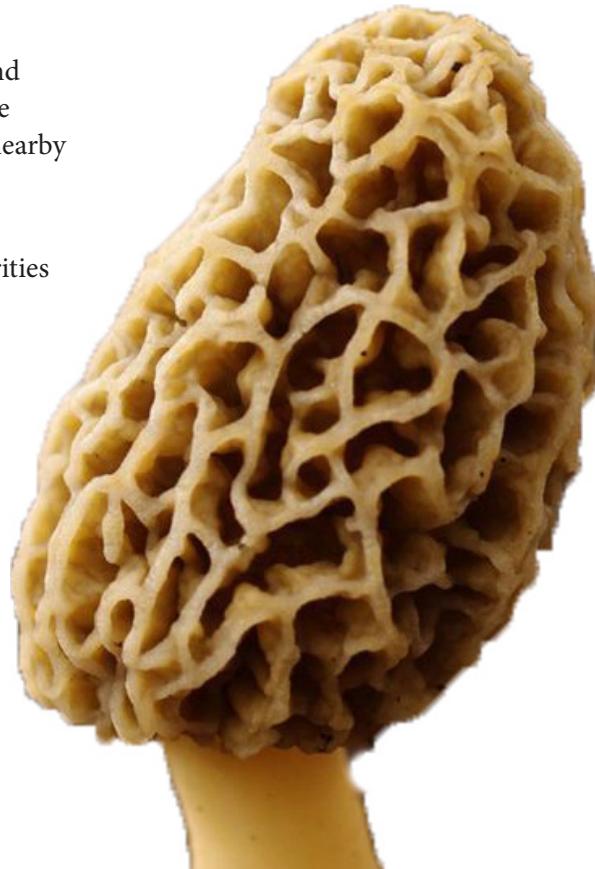
There are over 1500 types of mushrooms that grow in the PNW. Nearly 10,000 nationwide.

OREGONDISCOVERY.COM says that maybe only 20 percent of those are edible mushrooms and 5% have some medicinal benefits. They go on to say that about another 20 percent of mushrooms you find in the wild could make you sick or even kill you.

SINCE MUSHROOMS CAN BE POISONOUS, DO NOT EAT ANY MUSHROOMS THAT HAVE NOT BEEN IDENTIFIED AS EDIBLE BY A MUSHROOM FORGING MENTOR.

Some common varieties to find mushroom you can find in the Wilamette Valley and in the nearby Coastal Range:

- Chanterelles, in various hues
- Porcinis and other bolete varieties
- Morels
- Coral
- Hedgehogs
- Chicken of the Woods
- White Matsutake
- Oysters
- Lobsters
- Black Trumpets
- Honey Mushrooms



Mushrooms are also a farmed crop. Most grocery stores carry white buttons, crimini, portobellos and shiitake mushrooms. But if you're looking to try something a little more adventurous, your local farmer's market is the place to go. Along with mushroom forgers, mushroom farmers go to the local markets to sell their goods, like Rainforest Mushrooms (**RAINFORESTMUSHROOMS.COM**) in Eddyville, OR. Not only do they offer fresh maitakes, scallop and lion's mane mushrooms but also dried mushrooms and gourmet mushroom grow kits.

Grow kits are a block of soil that is inoculated with spores of an edible mushroom that is wrapped in plastic so you can take it home and grow your own mushrooms at home.

AMANITA MUSCARIA AKA FLY AMINITA (POISONOUS)



ROBOTICS: MEET SPOT

THE ROBOT DOG



By now you have probably seen some robots in the real world like drones, or even maybe the small white robots that deliver food. Did you know that Boston Dynamics, an American engineering and robotic design company, has created an intelligent and agile robotic dog and named it Spot? Spot is operated by a controller similar to that of an XBOX and also has some automatic features. You can use the screen that is inset into the controller to navigate Spot or you can tap a location on the screen and Spot will self navigate to reach that location. Industry partners with Boston Dynamics who lease a Spot can build modules and programs that allow Spot to perform complicated tasks otherwise done by humans like mapping out spaces or checking points on an oil rig.

Spot is meant to be whatever you need it to be. Most impressively being able to navigate stairs, and self-right and get back on its feet when it falls over. Spot has the ability to work independently when paired with third party software and hardware.

SPOT'S FEATURES:

- **90 MINUTE BATTERY LIFE**
- **ANDROID BASED CONTROLLER**
- **SPEEDS UP TO 3 MPH**

CHECK OUT SPOT'S CONTROLLER, YOU CAN USE THE SCREEN THAT STREAMS WHAT THE CAMERA ON FRONT OF SPOT TO NAVIGATE SPOT REMOTELY.



THE GROWTH OF BACTERIA

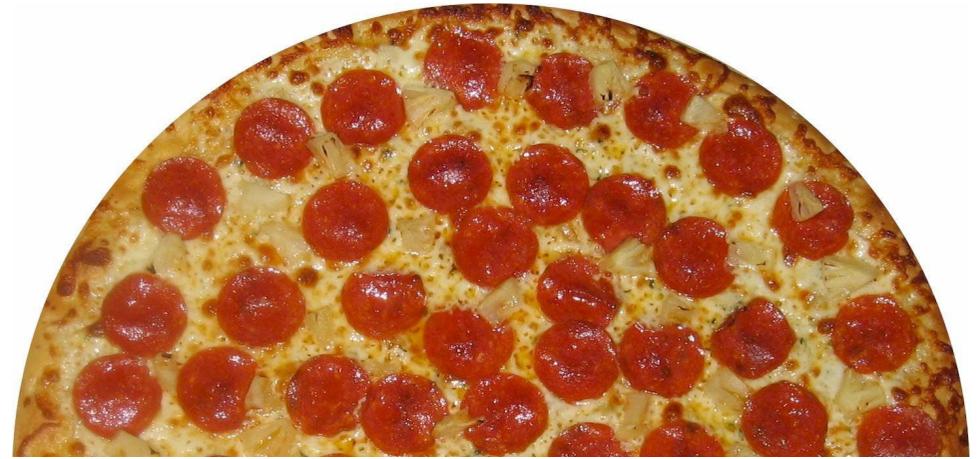


Baker's yeast is a bacteria that most of us consume everyday. Yeast is a key ingredient in breads and also pizza dough. Yeast is used to make the dough rise, the reason why sourdough bread becomes light and airy and why pizza dough is soft and puffy.

Yeast + lukewarm water + sugar = bubbly foam to form on top called bloom - this is caused by the growth of the yeast bacteria. Bacteria will multiply and the few grains of yeast you put into your warm water turns into an out of control monster. This is the same with the bacteria on your hands that can get you sick. Imagine the bacteria on your hands blooming like your baker's yeast, ew-www! You don't want to eat that. So before you start making your pizza be sure to tame the bacteria beasts and wash your hands.

One way to prevent foodborne illness (puking and upset stomach) is to eat and prepare food with clean hands, plates and utensils.

HOW PIZZA CAN PERSUADE YOU TO WASH YOUR HANDS



SCIENCE PROJECT FOR DINNER

SERVES 3-4

PIZZA DOUGH RECIPE

1. Mix 1 cup water, yeast and sugar and let it hang out for a few minutes while you're measuring other ingredients
2. Put flour, salt and oil in a mixing bowl
When the yeast and water mixture is a little foamy on top add mixture to mixing bowl
3. Knead the ingredients together for about 7 minutes - the dough should not be sticking to your hands or the bowl but create a smooth consistency that can hold its shape.
4. Leave dough in bowl and cover with a lightly damp and clean kitchen towel and let sit for 30 -45 minutes until it's doubled in size.
5. Put some flour on your counter and roll pizza dough out flat on the floury surface.
6. Transfer to baking tray, use a fork to make a bunch of tiny holes (called docking) in the dough so that it stays flat and keeps the toppings from getting push off by air bubbles.
7. Top with sauce and cheese and put in a 450 degree oven for about 12 minutes.

PIZZA DOUGH INGREDIENTS

- 3 cups flour
- 2 teaspoon granulated sugar
- 2 teaspoons baker's yeast (fleischmann's)
- 2 tablespoons olive oil
- 1-2 cups lukewarm water (start with 1 cup and slowly add more as needed)
- 1 tablespoon salt

SIMPLE ACTS OF SUSTAINABILITY



AMERICANS ALONE THROW AWAY 25 BILLION STYROFOAM COFFEE CUPS EVERY YEAR. STYROFOAM CANNOT BE COMPLETELY RECYCLED. MOST OF THE STYROFOAM DISPOSED OF TODAY WILL STILL BE PRESENT IN LANDFILLS 500 YEARS FROM NOW. -EARTHDAY.ORG



- Instead of buying your lunch or packing your lunch in single use plastics, use tupperware - making a sandwich and cleaning the tupperware should only take 5 minutes of your time. - you can also wash ziploc bags so you can use them again.



- Bike instead of getting a ride in a car. 2 miles by bike should only take about 7 minutes and it's a fun way to also move your body.



- Reusable water bottles, straws and silverware. These are easy and cheap things to find at your local grocery store and on Amazon. If you often single use water bottles, straws or silverware these alternatives will not only save your parents money in the long run but are easy to upkeep and an easy way to take an extra step towards producing less waste.

- Reusable bags - instead of buying individually wrapped candy, stores like Fred Meyer, co-ops, and Market of Choice have a huge bulk food section that includes bulk candies (many similar options to those prepackaged varieties). This is a great time to have a small reusable bag or tupperware to collect your candy. If you forgot your reusable container go with the small paper bags provided by the store rather than the plastic bags because paper is biodegradable and plastic is not.



- Make sure to turn off lights that are not in use and unplug your charging cables when not in use.

ILLUSTRATION: CREATIVITY IN STEM

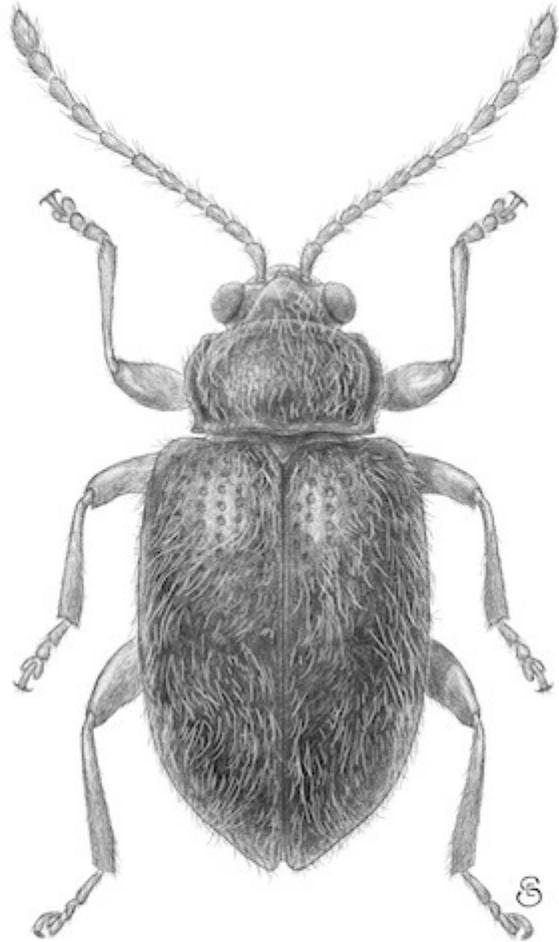
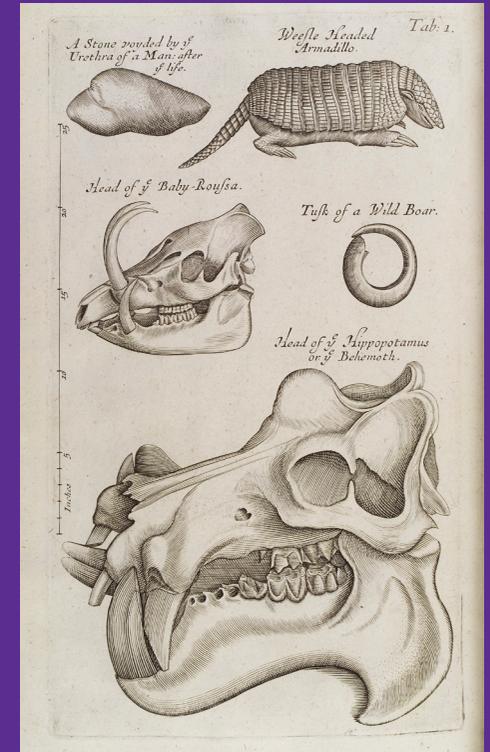
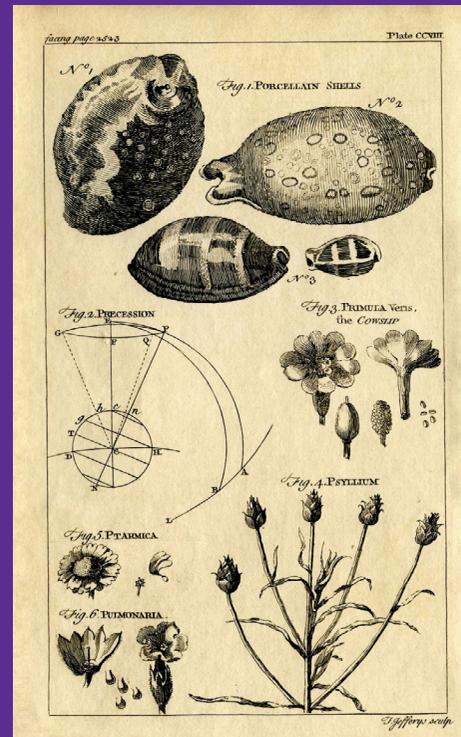
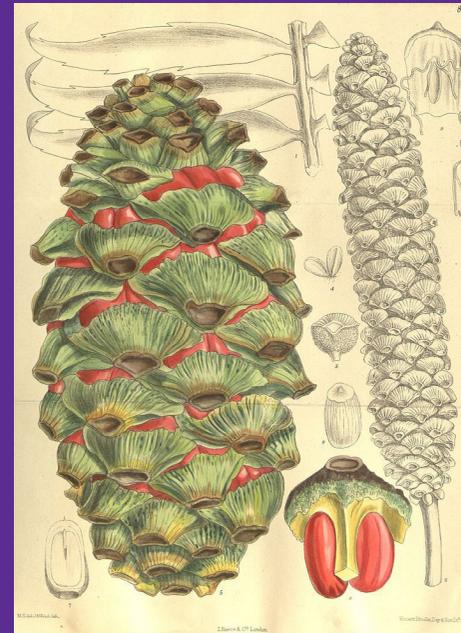


Illustration above: Sean Vidal Edgerton, otherwise known by @thepenandthepangolin on Instagram. Trained in art and biology Edgerton creates illustrations like this one for purposes of education. You can find more art by Edgerton at THEPENANDTHEPANGOLIN.COM



BIOLOGICAL ILLUSTRATION

These three illustrations show the wide variety of styles of illustrations that are accepted as biological illustration.

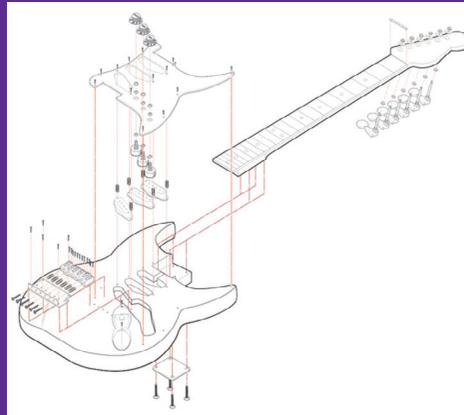
top left: Encephalartos barteri - circa 1909

top right: biological illustration of an areas local fauna.

bottom left: biological illustration of shells and flora from a specific region.



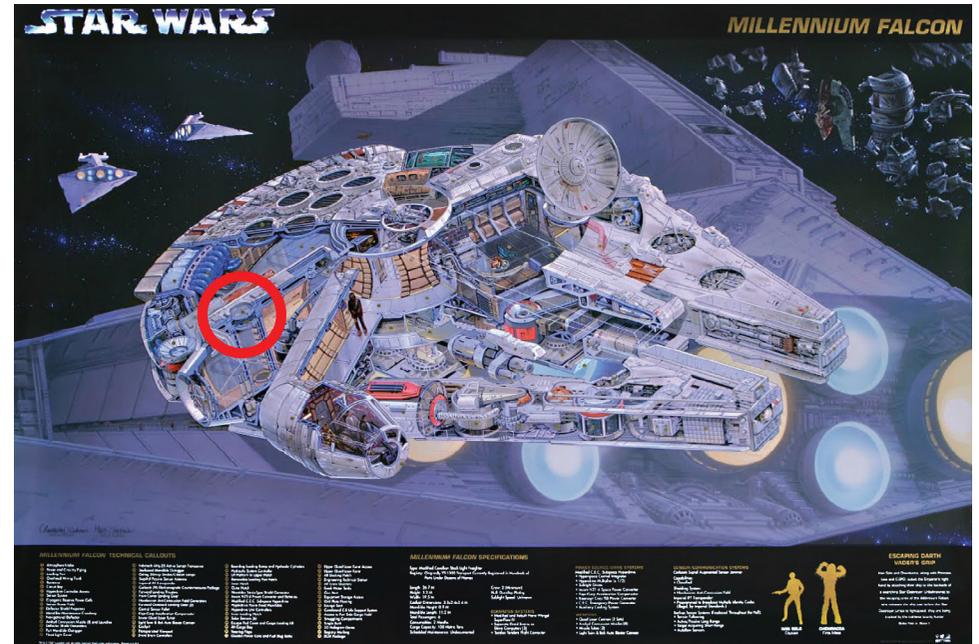
MEDICAL ILLUSTRATORS create anatomically correct illustrations for medical journals and textbooks for the purposes of education. Often Medical illustrations show how bodies and organs are laid out and where body parts are located.



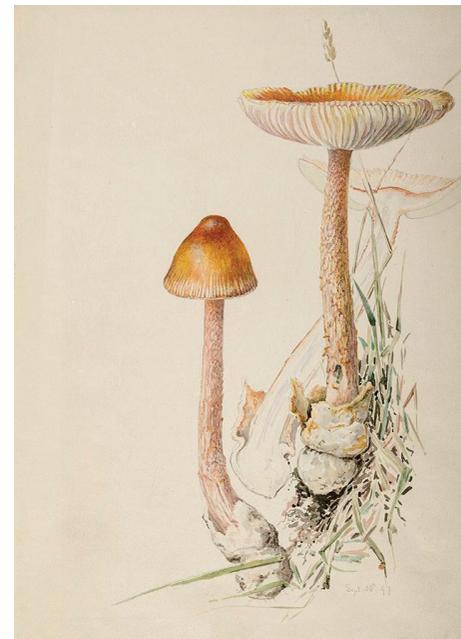
TECHNICAL ILLUSTRATION is meant to visually communicate information that is technical in nature like diagrams, instructions. Often depicting cut outs and cross sections of objects in order to better understand said object.

ELEMENTS OF SCIENTIFIC AND TECHNICAL ILLUSTRATION

- Title of Drawing
- Magnification of select elements
- Labels and annotations
- Scale bar
- Traditionally, no shading or cross hatching, only stippling (dotting)
- Clean, single lines, no sketchy lines
- All scientific names underlined
- Neat and clean drawing - no extra marks



Christopher Cushman, Technical and Cut-out Illustrator. Specializes in Star Trek and Star Wars illustrations, although has a large diverse portfolio.



“BUILD IT AND THEY WILL COME. IT’S A GREAT TIME TO BE AN ILLUSTRATOR, BUT YOU SHOULD SET ASIDE TIME TO DRAW SOME VANITY PROJECTS. THINGS YOU MIGHT NOT GET TO DO IN THE REAL WORLD AND DRAW THEM FOR YOURSELF. I DID WITH THE ENTERPRISE D AND IT TURNED INTO ONE OF THE GREATEST CHAPTERS OF MY LIFE! OPENED MANY DOORS AND OPPORTUNITIES OF WORK AND MEETING MY HEROES....”

-CUSHMAN, TECHNICALILLUSTRATORS.ORG

Beatrix Potter, prolific illustrator known for her work of draw Peter Rabbit also did many mushroom illustrations. This particular one was done is 1897.

A great resource for the budding Technical Illustrator, and where a lot of information in this article was found, **TECHNICALILLUSTRATORS.ORG**

Produced by:

Mid-Valley STEM-CTE HUB



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CHECK OUT HER WEBSITE: KACEYMONTGOMERYGRAPHICS.COM