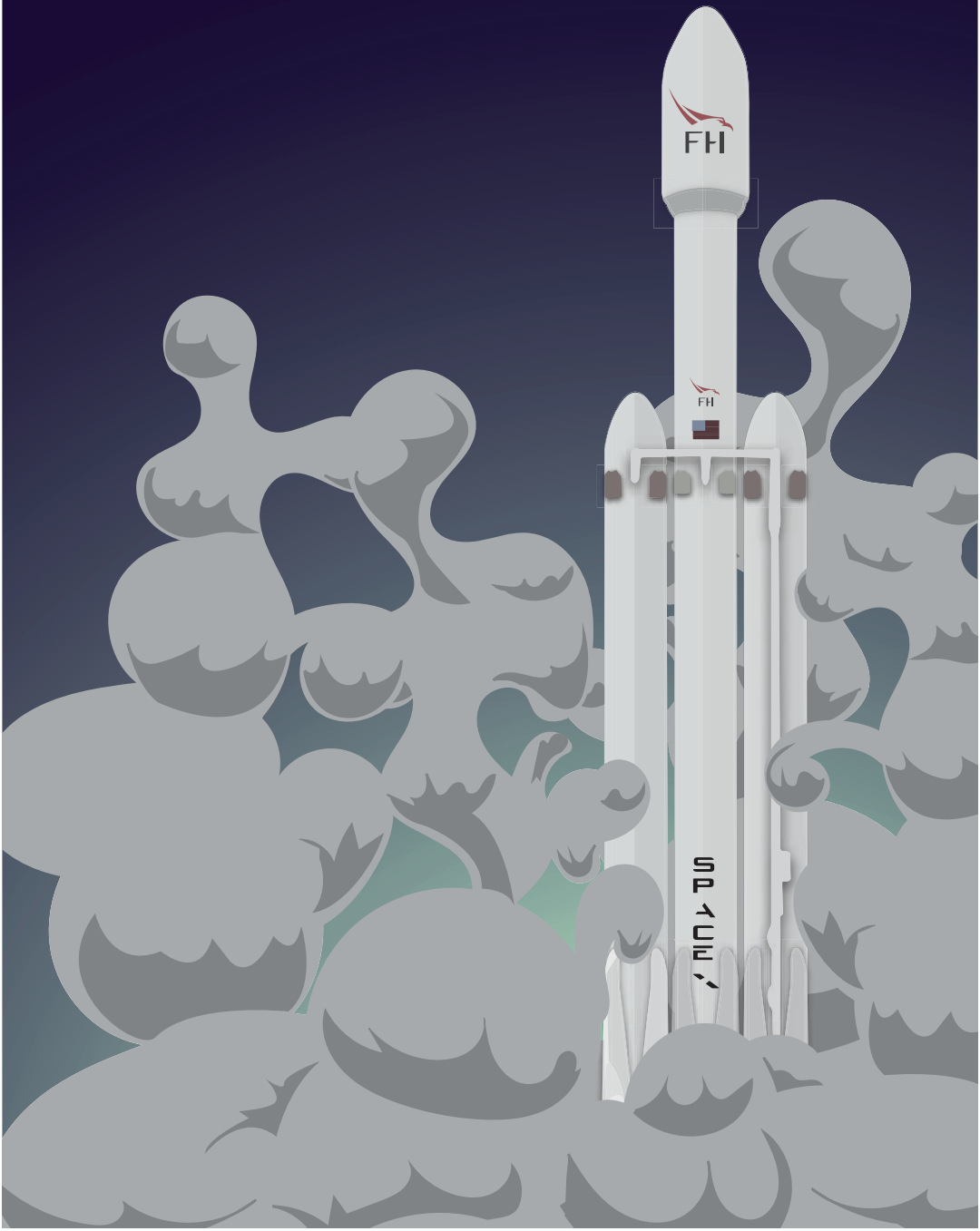
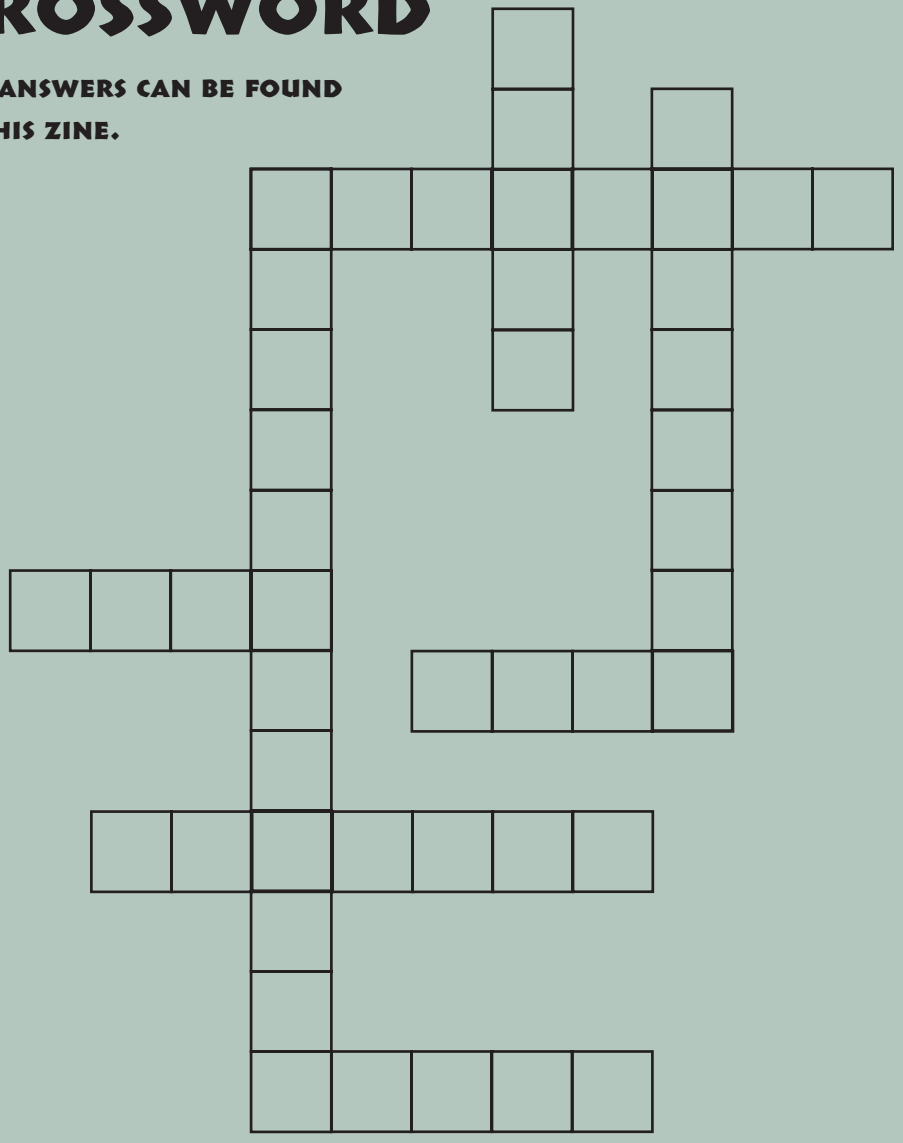
Terra Firma

issue #2



Crossword

All answers can be found in this zine.



1 Down - Musk got his degree at University _____
1 Across - What did the astronaut grow on Mars?
2 Down - Falcon_____
2 Across - Cob is made of sand, water, straw, and?
3 Down - Beavers are_____
3 Across - Nye the Science Guy
4 Across - International Space ____
5 Across - Giant _____ Barnacles

STEM Tik Tokkers You Should Know...

@macrofying, ZOOOOOOOOOM- ing in close with a microscope!

@andystechgarage creates rockets and lego robots.

@Nasablueberry1 is a female astronaut at NASA,she talks about all things space related.

Interested in coding and software development? Check out the account, @thecleverprogrammer.

@marinebiologistmel is a Ph.D. student and has a long list of fun content for biology lovers.

@billnye an oldskool classic, leading at home experiements and visual explanations of common science questions.

@oliverwilliamwalker gives lots of solid advice about getting a job in video game design.

For those interested in welding and fabrication @_nickmercer

@themath_ghost has some helpful math hacks that could make homework a little easier.

SPACEX

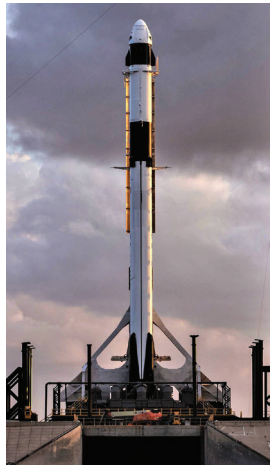
"Failure is the stepping stone to success."

2002 Space X is established.

2003 First successful test of Merlin engine and construction began on first Falcon 1 rocket.

2006 Falcon 1 ready to do first launch (unsuccessful)

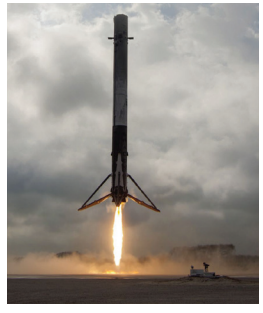
2006 Announced Dragon, a crew and cargo spacecraft.



2007 Falcon 1 second attempt (unsuccessful)

2007 Announced Starship, an interplanetary spacecraft. Made for a trip to Mars, should be ready for orbit in 2021

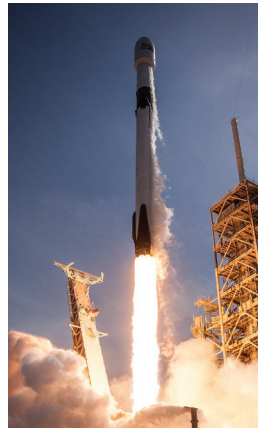
2008 Falcon 1 third launch, mission to deliver Trailblazer satellite into space. (unsuccessful)



2008 Falcon 1 fourth launch, Successfully got the rocket into orbit.

2008 1.6 billion dollar contract from NASA to take cargo to international space station minimum of 12 flights

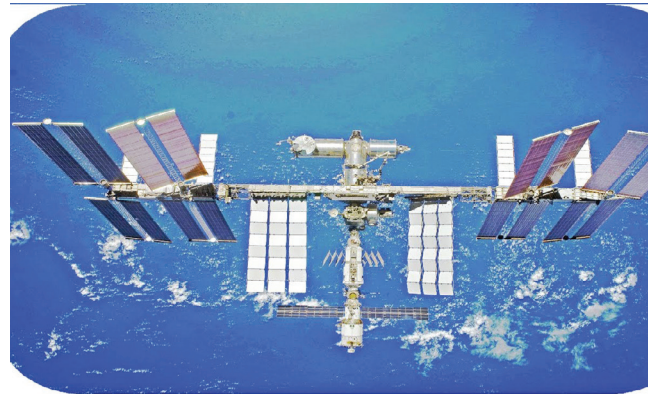
2010 Falcon 9 first launch. (Successful)



2011 SpaceX eliminates parachute, propulsively powered descent approach helps rocket land gently on its base.

2014 NASA selected Space X for crew transport to the space station

2015 Falcon 9 launched and vertical landed successfully, first for an orbital class rocket.



International Space Station

2018 Falcon Heavy - combines 3 Falcon 9s to create 1 rocket with a heavy payload.

2020 Flew astronauts to the International Space Station.

Falcon Heavy

SpaceX's Falcon Heavy is a partially reusable heavy-lift launch vehicle. Inspired by the Falcon 9 vehicle, Falcon Heavy consists of a strengthened Falcon 9 first stage as the center core with two additional first stages as boosters. Known for being the rocket that took a Tesla Roadster into space.

Developed in 2018

Launched 3 times

Mass = <3 million lbs

Payload to Mars = <37,000lbs

Height = 230 ft

diameter 12 ft

Elon Musk

Born 1971, in South Africa. In 1995, Musk got dual bachelor's degrees in economics and physics at University of Pennsylvania. After moving to California, Musk started Paypal in 2000 and SpaceX in 2002, but those aren't the only companies Musk is associated with. Y ou may also know him as the CEO of Tesla.

Tidepools

Tidepools are tiny, independent ecosystems filled with a large variety of fascinating species of aquatic life. Surprisingly you can go visit tidepools because the Oregon Coast is home to hundreds if not thousands of tidepools. No two tidepools are the same and beaches in nearby Newport, Waldport, Yachats, Lincoln City, and Florence all host these incredibly unique wonders.

Things you can find in Oregon tidepools...

-Hermit crabs
-Sea anemone
-Sea starts
-Mussels
-Small Sculpins
-Limpets
-Chitons
-Giant Acorn Barnacles
-Nudibranchs

-Plume Worms
-Porcelain Crabs
-Sea Urchins
-Purple Shore Crabs
-Split Kelp
-Iridescent Seaweed
-Winged Kelp
-Coral Leaf Algae
-Encrusting Coralline Algae

Tidepool Safety and Etiquette

-Check the tides. The best time for tidepools is low tide, when the tide is coming in it's time to leave the tidepools. High tide can be dangerous.

-Wear sturdy shoes. Areas around tidepools may be slippery or jagged, and can cause injury if not careful.

-Return sealife exactly where you found it. Do not remove animals attached to rocks like limpets, anemones and barnacles.

-Do not trample tidepools. Observe and enjoy from the sidelines.

-Do not bring sealife found in tidepools home with you.

-Make sure any rocks you may overturn are returned to their original position. Rocks are habitats in which sealife live on or under.

Is it a Beaver?

It might be a beaver or, it might be a nutria.
Here are a few ways to tell them apart.

Beavers and nutria both thrive here in Oregon, live in the same type of habitat and have many similar physical characteristics. While beavers are native to Oregon, the smaller nutria was brought here by fur trappers from South America in the 1930s when beaver fur was in fashion. Why did they bring nutria when it was beaver that was in fashion? Well, the beaver were being over-trapped and becoming endangered, nutria have similar coats, breed faster and are easier to trap, making them a shoe-in to supplement the demand for beaver pelts. Now that beaver is out of fashion both species have high populations all over the state of Oregon and here's how you can tell if you're looking at beaver or a nutria in the wild.

American Beaver

Size: 40 lbs
Tail: flat and wide
Home: self-made lodge that sits on top of pond or dammed streams
Food: bark, twigs, buds and stems of trees, supplemented with grasses and roots.
Nocturnal

Nutria

Size: 10-20 lbs
Tail: long, thin, and hairless
Home: burrowed den at water's edge, big enough for 2
Food: grass, cattails and roots
Active during the day.

The Martian

Recently, I was shown the movie, The Martian, which stars Matt Damon. The movie starts with a team of NASA astronauts on Mars, they're collecting data and researching various things. A dangerous storm begins to roll into their camp and the team decides that they need to evacuate the planet and head back to Earth. Long story short Matt Damon gets stranded on Mars and no one knows he's alive for a long time.

Instead of giving up on himself and resigning to his fate of starving to death on a foreign planet, Matt Damon's character uses his brain to survive. See, the character is a botanist and has learned many things over the course of his life that when exercised properly helps him not only survive but for some time thrives completely on his own.

For example, he grows his own food supply and for a long time lives solely on the potatoes he was able to grow in martian dirt and his own…. manure.

Now, this is a lesson in perseverance. If a guy can survive on Mars for over a year on his own you can survive here on Earth too. Through life-long learning, keeping a positive mindset, willing to take risks, and being a self-starter, you can do anything you put your mind to. It may not happen overnight, but if you continue to grow and work and learn, you too will thrive.

On the next page, there's everything you need to grow some potatoes for yourself and how to cook them.

Thrive on my dudes!

Growing Your Own French Fries

Step 1: Turn bucket upside down and use hammer and nail to make 5 water drainage holes, by tapping the nail into the bucket until a hole is punctured in the plastic.

Step 2: Put soil in the bottom of the bucket. Make sure the entire bottom is covered by 1 inch of potting soil.

Step 3: Set your seed potatoes on top of soil layer.

Step 4: Cover seed potatos with 2 inches of soil and gently water. Set outside to grow in a place that get sun at least half the day.

Step 5: Keep an eye on sprouts, as the plants start gowing out of the soil keep covering them little bit by little bit until you run out room in the bucket. Water every 1 to 2 days.

Step 6: Harvest, they should be ready to eat after 3 - 4 months.

Supplies:

1 - 5 gallon bucket

3 - seed potatos
(old potato that's growing eyes)

1 - 1 cubic foot bag of potting soil

1 - nail

1- hammer

French Fry Recipe

Step 1: Pre-heat oven to 400 F.

Step 2: Cut potatoes into french fry shape and let soak in cool water while oven gets up to temperature.

Step 3: When oven has reached 400 degrees, remove the potatoes from the water and pat dry with dish towel. Put potatoes into a large bowl with some canola oil and toss so that potatoes are lightly coated in oil.

Step 4: Lay potatoes out on a baking tray. If you have parchment paper it helps to use it as a barrier between the pan and potatoes for easy clean up.

Step 5: Lightly salt the potatoes and put in oven on that top rack. Cook for 20-30 minutes. You want the outside crisp and inside tender.

Earthship Homes

An earthship is a home built primarily out of renewable and upcycled materials. People designing these homes use alternative methods to building compared to standard home construction. Perhaps the most popular version is a method called a cob house. A cob house is traditionally made by using straw bales as insulation and building up with mud bricks called cob, (a mixture of sand, clay, water, and straw) around the straw bales to create walls. This technique not only creates a well insulated home but also an incredibly unique looking home as well.

Many people that build earthship type homes also implement ways to make their homes more energy "passive" where the home requires less energy consumption to keep the home warm in the winter and cool in the summer. Other passive techniques to acquire and keep energy are using wind and solar energy to be able to turn on lights and run the refrigerator. Triple paned windows, building berms on the sides of the house or against a hill, and use of thermal mass like slab concrete foundation, adobe, and tiles. These methods help insulate against temperature changes and allow the house to regulate temperature eliminating the need for heating and cooling utilities. This method is called biothermal temperature regulation.

Fun Fact:

Earthship is actually a brand name like Qtip or Kleenex, that has become synonymous with sustainable home designs.

Elements you may find in an earthship home:

- Used tires and Tire bales
- Sandbags
- Used bottles
- Cob
- Upcycled wood and metals
- Water collection systems
- Straw bales
- Adobe mud
- Composting toilets
- Rooftop garden
- Fireplaces and wood stoves

Youtube channels that feature earthship homes:

- Hardcore Sustainable
- Kirsten Dirksen
- Exploring Alternatives
- The Off Grid Guru
- Living Big in a Tiny House

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