The Wizarding World of STEM

| **Day 1 | Magical Materials** | | | |
| --- | --- | --- | --- |
| Admin | 00:10 | * Create name tags * Introduce the 4-H team * Take attendance * Complete pre-surveys * Create ground rules with youth | |
| Hat Sorting Ceremony | 00:15 | DiSC personality test | [Sorting Hat](https://www.orientaltrading.com/harry-potter-sorting-hat-a2-RU49953.fltr?sku=RU49953&BP=PS544&ms=search&source=google&cm_mmc=GooglePLA-_-17376747105-_-136513389599-_-RU49953&cm_mmca1=OTC%2BPLAs&cm_mmca2=GooglePLAs&gclid=CjwKCAiAl9efBhAkEiwA4ToriptwR2IL5_EscdrvOA75Oj3aFpHk8YA6HAt24_Z1-4OZnl62ZHuPOxoCunUQAvD_BwE)  Printed personality tests  Pencils |
| 00:15 | Debrief and move into teams |
| STEM Discussion | 00:10 | [Materials science video](https://www.youtube.com/watch?v=tGfLhPslEjQ) and discussion | |
| Wand-making | 00:10 | **Material Science**  Discuss safety while using the whittling tools  [Watch](https://www.youtube.com/watch?v=fqhP-8EdBJI) whittling cuts video | [Wood](https://www.joann.com/walnut-hollow-carving-block/2190601.html?utm_source=google&utm_medium=organic-shopping)  Glue  [Whittling tools](https://www.amazon.com/BeaverCraft-S15-Whittling-Wood-Carving/dp/B07P578XFV?ref_=ast_sto_dp)  [Air dry clay](https://www.odpbusiness.com/catalog/catalogSku.do?id=527888&SEO=Crayola&reg;%20Model%20Magic&reg;%20Classpack&reg;,%201%20Oz.%20Pouch,%20Case%20Of%2075%20Pouches,%20Assorted%20Colors)  [Ribbon](https://www.amazon.com/Fabric-Ribbon-Package-Wrapping-Wedding/dp/B07HKKKDHJ/ref=sr_1_10?keywords=assortment+of+ribbons&qid=1677786271&sr=8-10)  [Paint](https://www.amazon.com/Apple-Barrel-PROMOABIII-Acrylic-2-Ounce/dp/B076CP6F36/ref=sr_1_5?crid=35RRKW4S1MTX4&keywords=acrylic+paint&qid=1677786353&sprefix=acrylic+paint%2Caps%2C145&sr=8-5)  [Rubber cement](https://www.odpbusiness.com/catalog/catalogSku.do?id=443650)  [Paintbrushes](https://www.odpbusiness.com/catalog/catalogSku.do?id=5792531)  [Tablecloth](https://www.amazon.com/Exquisite-COMINHKPR42890-Cerise-plastic-table/dp/B0047QSQXQ/ref=sxin_16_pa_sp_search_thematic_sspa?content-id=amzn1.sym.824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37%3Aamzn1.sym.824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37&cv_ct_cx=plastic%2Btablecloth&keywords=plastic%2Btablecloth&pd_rd_i=B0047QP92W&pd_rd_r=a21b089e-af20-4c6a-8b29-7a2174a58588&pd_rd_w=QwupS&pd_rd_wg=3LCOC&pf_rd_p=824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37&pf_rd_r=S7B33070DP33BGJ41HMN&qid=1677786744&sprefix=plastic%2Btab%2Caps%2C163&sr=1-3-a73d1c8c-2fd2-4f19-aa41-2df022bcb241-spons&smid=AGPO9BDK9N4N0&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUEyN0QzRjNXQjZOT0c3JmVuY3J5cHRlZElkPUEwMDk1MzIzMjQ4NVJTRE8yRlNMQSZlbmNyeXB0ZWRBZElkPUEwMTg2NDQ4MVEwTVJRMFIzTTNDViZ3aWRnZXROYW1lPXNwX3NlYXJjaF90aGVtYXRpYyZhY3Rpb249Y2xpY2tSZWRpcmVjdCZkb05vdExvZ0NsaWNrPXRydWU&th=1)  [Gemstones](https://www.amazon.com/Chip-Stone-Beads-Multicolor-Irregular/dp/B08GWKLL3G/ref=sr_1_20?crid=DULVGECJUISO&keywords=crafting+supplies+jewels+beads&qid=1677786494&sprefix=crafting+supplies+jewels+beads%2Caps%2C166&sr=8-20) |
| 01:00 | Whittling wood  Decorating wands |
| Leather crafting | 00:45 | Stamping leather notebooks | [Leather-bound books](https://www.amazon.com/Refillable-Travelers-Notebook-Handmade-ai-natebok/dp/B078WQ751M?source=ps-sl-shoppingads-lpcontext&ref_=fplfs&smid=A1ZMLOZGAJRXC9&th=1)  Leather stamping supplies |
| Debrief | 00:15 | How would you improve the materials we used to make the wands and leather notebooks? | |
| Notes:   * Personality test was a little too old for some of them * Have them draw their wands on the wood, then use the band saw to take off some of the bulk before start whittling. * Let them work on whittling and leather-crafting throughout the rest of the day, so explain them both after the material science video and discussion. | | | |

| **Day 2 | Sphero Spells** | | | |
| --- | --- | --- | --- |
| Admin | 00:10 | * Hand out surveys to any new youth * Re-introduce the 4-H team * Take attendance * Go over today’s activities and agenda | |
| Recap | 00:10 | What did we do yesterday?  What careers do you think would use materials science? | |
| Transfiguration Class | 01:00 | **Creative Writing**  Observation skills | Notebooks  Pencils |
| Charms Class | 01:00 | **Computer Science & Coding**  Design a path around the table, figure eight, shapes, etc. | Spheros  Laptops |
| Herbology Class | 00:30 | **Hydroponics & Plant Science**  What is Hydroponics? What is Plant Science?  [Powerpoint presentation](https://docs.google.com/presentation/d/1hw3IDOUqHb7cR00CTv-pBQEQEbh_sPgp/edit?usp=share_link&ouid=102276077790053555377&rtpof=true&sd=true)  [Notes for presentation](https://docs.google.com/document/d/1ZZoUXghp1d3EpfOyxm8bHqyrAGdxzEuoLI21ScCnwdA/edit?usp=share_link)  Create microgreens kits | [Containers](https://www.amazon.com/TIYA-Takeout-Food-Containers-Microwavable/dp/B09YVM3YD4?source=ps-sl-shoppingads-lpcontext&ref_=fplfs&smid=A2DFIIW5HK78WJ&th=1)  [Reusable paper towels](https://www.amazon.com/CLEAN-LEADER-Reusable-Disposable-Multi-purpose/dp/B07GQXPLB8/ref=sr_1_21?crid=3TSKM1BMZSYOH&keywords=food+service+reusable+paper+towels&qid=1677790711&s=home-garden&sprefix=foodservice+reusable+paper+towels%2Cgarden%2C155&sr=1-21)  Seeds  Water |
| Debrief | 00:10 | What did you learn about plant science?  Talk about the entrepreneurship activity for tomorrow | |
| Notes:   * Read a poem, discuss. Talk about what youth observe about something (we did plants) and take notes. Write a poem about the plant that they observed. * Instructions on how to build a microgreens kit below * Was done early! | | | |

| Day 3 | Entrepreneurship in the Wizarding World | | | |
| --- | --- | --- | --- |
| Admin | 00:10 | * Re-introduce the 4-H team * Take attendance * Go over today’s activities and agenda | |
| Recap | 00:10 | What did we do yesterday?  What careers do you think would use creative writing and science?  What careers do you think would use computer coding or plant science and hydroponics? | |
| The Great Wizarding Bank | 01:00 | **Financial Literacy**  *Habitudes Game*  Read statements on cards and have them categorize the statements as something that sounds like them, doesn’t sound like them, or maybe sounds like them. Debrief based on their most common spending and savings habits. | Habitudes Game for teens |
| Wizard Joke Shop | 00:15 | **Entrepreneurship** An entrepreneur is an individual who takes the risk to start their own business based on an idea they have or a product they have created while assuming most of the risks and reaping most of the rewards of the business.  Create a product to sell in the joke shop. Work through the product design plan.  The Joke Shop’s one demand:**Your product must have some sort of movement or action to it.**  Share examples: [Weasley’s Wizarding Wheezes examples](https://www.hp-lexicon.org/thing/weasleys-wizard-wheezes-products/) | [Handout](https://docs.google.com/document/d/1epB3S14oGPEjE3tJUksmfq1n3t-nAdhCUhsJd3-mKD0/edit?usp=sharing) |
| 01:00 | 01. Identify  Idea generation: What? Target audience? Price? | [Popcicle sticks](https://www.amazon.com/Artlicious-Wooden-Popsicle-Sticks-Standard/dp/B07KCTZQDS/ref=sxin_17_ac_d_rm?ac_md=3-3-cG9wc2ljbGUgc3RpY2sgY3JhZnRz-ac_d_rm_rm_rm&content-id=amzn1.sym.b09913c7-88ee-4b06-b977-3fd4ebd29a25%3Aamzn1.sym.b09913c7-88ee-4b06-b977-3fd4ebd29a25&cv_ct_cx=popsicle+stick&keywords=popsicle+stick&pd_rd_i=B07KCTZQDS&pd_rd_r=a0e4ed0c-a6ea-4d50-8785-9838681b7b51&pd_rd_w=v58s8&pd_rd_wg=T4Git&pf_rd_p=b09913c7-88ee-4b06-b977-3fd4ebd29a25&pf_rd_r=5VQ4HNF08ZVVW0972XNX&qid=1677791764&sprefix=popci%2Caps%2C290&sr=1-4-7d9bfb42-6e38-4445-b604-42cab39e191b)  Hot glue gun  Mini glue sticks  [Wood blanks](https://www.amazon.com/Creativity-Street-Natural-Wood-Shapes/dp/B000F8V6BY/ref=sr_1_4?crid=3MCX7ERZJ1A9&keywords=wood+blanks+assortment&qid=1677791924&sprefix=wood+blanks+assortment%2Caps%2C145&sr=8-4)  [Buttons](https://www.amazon.com/Assorted-Childrens-Painting-Handmade-Ornament/dp/B076FLR6X1/ref=sxin_16_pa_sp_search_thematic_sspa?content-id=amzn1.sym.824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37%3Aamzn1.sym.824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37&crid=3G87BOFI6NVFA&cv_ct_cx=buttons+assortment&keywords=buttons+assortment&pd_rd_i=B076FLR6X1&pd_rd_r=caba15da-2190-4866-8e76-838fc26e0b96&pd_rd_w=JEDLs&pd_rd_wg=Coz8E&pf_rd_p=824ce8c0-071d-4ae0-a0bd-93ac8c4d5e37&pf_rd_r=HWKKCDPDA7WQYWXZRZ9H&qid=1677792037&sprefix=buttons+assortment%2Caps%2C244&sr=1-4-a73d1c8c-2fd2-4f19-aa41-2df022bcb241-spons&psc=1&spLa=ZW5jcnlwdGVkUXVhbGlmaWVyPUExNEk5RldWNDIxQ1U1JmVuY3J5cHRlZElkPUEwMjU5MTQ4MUMwSEFUSlZFSERBVyZlbmNyeXB0ZWRBZElkPUEwNTIzMTA0S0FNWVhVQkY4UTBFJndpZGdldE5hbWU9c3Bfc2VhcmNoX3RoZW1hdGljJmFjdGlvbj1jbGlja1JlZGlyZWN0JmRvTm90TG9nQ2xpY2s9dHJ1ZQ==)  [Construction paper](https://www.odpbusiness.com/catalog/catalogSku.do?id=8239877)  [Markers](https://www.odpbusiness.com/catalog/catalogSku.do?id=157104)  Permanent markers  Glue sticks  Pipe cleaners  String/yarn  Fabric |
| 02. Brainstorm  Categorize into a theme (toy, puzzle, game, joke, etc.)  Draw up a design. |
| 03. Prototype  Begin creating and keep notes! |
| 04. Branding  Develop product name, packaging, and details. If time, create a jingle or advertisement. |
| 00:15 | 05. Launch  Present to the room what you created. |
| Debrief | 00:10 | What changes did you make to your project from the design plan to the final prototype? | |
| Notes:   * Pick a different starting activity. Something more geared towards small businesses? Or something around leadership? * Have them complete sections 1 and 2 before beginning to build their prototype. Tell them to use the prototype section to keep notes. Then once they have a prototype, complete the branding section. * Launch = presenting what they invented * Provide anything and everything you have around - scraps from other projects, different types of tape and glue, modeling clay was used a lot, etc. | | | |

| Day 4 | The Magic of Food Science | | | |
| --- | --- | --- | --- |
| Admin | 00:10 | * Re-introduce the 4-H team * Take attendance * Go over today’s activities and agenda | |
| Recap | 00:10 | What did we do yesterday?  What kind of small businesses would you open if you were an entrepreneur? | |
| Bubbling Brews | 01:00 | **Food Science**  Make a new beverage | [Root beer](https://www.walmart.com/ip/SodaStream-Root-Beer-Flavor-Sparkling-Water-Drink-Mix-14-8-oz-Bottle/46770322), [orange soda](https://www.walmart.com/ip/SodaStream-Orange-Sparkling-Water-Drink-Flavoring-Mix-14-8-oz/46770316), [Dr. Pete](https://www.walmart.com/ip/SodaStream-Dr-Pete-Sparkling-Water-Drink-Mix-14-8-fl-oz/46770320?athbdg=L1600), and [diet cola](https://www.walmart.com/ip/SodaStream-Diet-Cola-Sparkling-Water-Drink-Mix-14-8-oz-Bottle/46770318) drink concentrates  Wooden stir sticks  Cups  Pineapple, apple, cranberry, and tomato juice  Sugar  Spices  Measuring spoons  Sparkling and distilled water |
| Pumpkin Pasties | 01:30 | The science of cookies: [Baking Science Ted Talk](https://thekidshouldseethis.com/post/67473200270)  **Baking Science**  Making pumpkin pasties and other variations while learning about baking science | [Toaster ovens](https://www.walmart.com/ip/Mainstays-4-Slice-Toaster-Oven-Black/110900228?athbdg=L1102)  Pumpkin puree  [Ready-made pie crust](https://www.walmart.com/ip/Pillsbury-Mini-Pie-Crusts-14-ct-14-1-oz/946405708?wmlspartner=wlpa&selectedSellerId=0&wl13=5483&adid=22222222277946405708_117755028669_12420145346&wmlspartner=wmtlabs&wl0=&wl1=g&wl2=c&wl3=501107745824&wl4=pla-294505072980&wl5=9016077&wl6=&wl7=&wl8=&wl9=pla&wl10=8175035&wl11=local&wl12=946405708&wl13=5483&veh=sem_LIA&gclid=Cj0KCQjw8qmhBhClARIsANAtboffmWcNVOS5mAqo4cMiuurJx2x2IT8dn76ghOCNesLeFrEG4uKx6nIaAh7UEALw_wcB&gclsrc=aw.ds)  Spices  Eggs  Other purees & ingredients  Paring knives  Plates, napkins, forks, bowls  [Cutting boards](https://www.walmart.com/ip/Dixie-Ultra-Disposable-Paper-Cutting-Boards-10-Count-10-x-13-Large-Boards-for-Kitchen-Meal-Prep/216153797?athbdg=L1600)  Pastry brushes  Parchment paper |
| Debrief | 00:10 | What would you change in your recipes if we had more time? What other ingredients would you include? | |
| Notes:   * See instructions below. * I found Pilsbury mini pie crusts. * Baked at 425 for 10 minutes. * All three of the toaster ovens on one power strip tripped the breaker over and over. | | | |

| Day 5 | Quadrival Tournament | | | |
| --- | --- | --- | --- |
| Admin | 00:10 | * Re-introduce the 4-H team * Take attendance * Go over today’s activities and agenda | |
| Recap | 00:10 | What did we do yesterday?  What careers would use food science every day? | |
| Potions Class | 00:45 | **Chemistry**  Creating slime and learning the science behind what’s happening  [Watch](https://www.youtube.com/watch?v=4F9ukCQvP20) (end at 4:50)  Have groups decide if they want to make their slime by adding glue solution into borax solution or adding borax solution into glue solution. | [Elmer's glue](https://www.walmart.com/ip/Elmer-s-Liquid-School-Glue-Clear-Washable-Great-for-Making-Slime-1-Gallon/748285306)  [Borax](https://www.walmart.com/ip/Borax-20-Mule-Team-Detergent-Booster-65-Oz/729204870)  Water  Food coloring  Glitter  Measuring cups  Stirring utensils  Plastic cups  [Containers](https://www.walmart.com/ip/Freshware-Plastic-Containers-with-Lids-8oz-50-Pack-YH-S8X40/52727941)  [Mix-ins](https://www.amazon.com/LoveAloe-Colorful-Handmade-Making-Decoration/dp/B08CB6CK7G/ref=sr_1_29?crid=3CDD70WEUL89N&keywords=foam%2Bballs%2Bfor%2Bslime&qid=1677859920&sprefix=foam%2Bballs%2Bfor%2Bslime%2Caps%2C121&sr=8-29&th=1) |
| Debrief | 00:15 | Which way was easier to make slime?  Why do you think one way was easier than the other? | |
| Quadrival Tournament | 00:15 | **The Quidditch Match**  Toss the quaffles into the hoola hoops laying on the ground without them bouncing out. | Hoola hoops  [Beach balls](https://www.partycity.com/mini-inflatable-beach-balls-24ct-346776.html)  Masking tape |
| 00:15 | **The Dragon's Egg**  Team lines up and has to pass the dragon's egg over their heads and under their legs, alternating, until they get to the end. Then turn around and pass it back again. | [Dragon balloons](https://www.amazon.com/BeYumi-Balloons-Assorted-Dinosaur-Dungeons/dp/B092HYW5TB/ref=sr_1_6?crid=32G461OPAF32B&keywords=dragon%2Bpattern%2Bballoon&qid=1677863751&sprefix=dragon%2Bpattern%2Bballoon%2Caps%2C94&sr=8-6&th=1) |
| 00:15 | **The Great Hall**  Each team needs to place the food item cards in the right category. | [Food cards](https://www.canva.com/design/DAFcKyVVPfQ/DhYTqaxOwbrIonHfjCBflg/view?utm_content=DAFcKyVVPfQ&utm_campaign=designshare&utm_medium=link&utm_source=homepage_design_menu)  [Buckets](https://www.walmart.com/ip/Sterilite-10-Qt-Spout-Pail-Classic-Titanium/28904357?athbdg=L1102) |
| 00:15 | **The Maze**  Each team has a blindfolded person and the team must direct them through the maze to the Quadrival Cup. | [Blindfolds](https://www.walmart.com/ip/Happy-Date-20Pcs-Eye-Mask-Shade-Cover-Blindfold-Travel-Sleep-Eye-Masks-with-Nose-Pad-for-Travel-Sleep-or-Party-Supplies-Game/1463006925?wmlspartner=wlpa&selectedSellerId=101109825)  [Spray chalk](https://www.amazon.com/Montana-Cans-MXCH-9000-Chalk-Spray/dp/B00JEECAEW/ref=pd_bxgy_vft_med_img_sccl_2/133-4697739-3272941?pd_rd_w=ZE6zm&content-id=amzn1.sym.7f0cf323-50c6-49e3-b3f9-63546bb79c92&pf_rd_p=7f0cf323-50c6-49e3-b3f9-63546bb79c92&pf_rd_r=JKF35846NP6XNGVK1S8B&pd_rd_wg=qt5qq&pd_rd_r=906f2542-d768-4ccc-8c20-c22a45b905b7&pd_rd_i=B00KBYNOEO&th=1) or masking tape |
| Surveys | 00:30 | Post-Surveys | |
| Closing Ceremony | 00:30 | Debrief with:   * 3 things you learned * 2 things you’ll share with a friend * 1 favorite thing   Certificates and goodie bags | Certificates  4-H swag |
| Notes:   * The plan was to have the teams formed from the personality test on day one compete against each other, but we didn’t have enough kids to form multiple teams. So they all played The Quidditch Match and The Dragon’s Egg events together for time. The Great Hall event I split them into two groups. And The Maze they paired up and switched the direction-giver and blindfolded person. * Printed the food cards on different colored backgrounds for 4 different teams. | | | |

Email Rachael at [smith630@purdue.edu](mailto:smith630@purdue.edu) with any questions!

**How to Build a Microgreens Kit**

1. Cut the reusable paper towel down to just a couple of layers that will lay on the bottom of the container.
2. Add 1-2 Tbsp of water to the bottom of the container.
3. Sprinkle seeds in an even layer over the wet towel - it should be pretty densely covered with seeds.
4. Cover the container with the lid upside down in a warm, dark place for 3 days
5. Then place in the sun with the lid on right-side up and lose for another 3-4 days.
6. Harvest with scissors and eat!

**Brew Your Own Beverage**

1. Find a partner
2. Plan your drink recipe with measurements using the guidelines (see below)
3. Bring drink recipe to Rachael for approval
4. Follow your recipe and taste your beverage
5. Make notes on what you liked, didn’t like, and how you would change the recipe

**Beverage Recipe Guidelines**

| *Must use* ***at least 1 juice*** | *Must use* ***at least one “other” ingredient*** |
| --- | --- |
| Pineapple Juice  Apple Juice  Cranberry Juice  V8 Tomato Juice | Sparkling Water  Distilled Water  Root Beer Concentrate  Orange Soda Concentrate  Diet Cola Concentrate |
| *Must use* ***at least 1 spice, salt, or sugar*** | |
| Cinnamon  Pumpkin pie spice  Black pepper  Chili powder  Italian seasoning  Paprika  Salt  Sugar | |

**Build Your Own Pumpkin Pasties**

1. Find a partner
2. Plan your pumpkin pastie recipe with measurements
3. Bring your recipe to Rachael for approval
4. Write your name(s) on a piece of parchment paper
5. Use bowls to mix your filling
6. Put a spoonful of the filling onto the pie crust
7. Fold over the pie crust or add a second circle of pie crust on top and use a fork to pinch the edges together (see photos)
8. Poke a few holes in the top
9. Optional: add toppings like egg wash or sugar
10. Bake at 425 F for 10 minutes



Ingredients suggestions:

| Eggs (for egg wash) | Apples | Blueberries |
| --- | --- | --- |
| Cream Cheese | Shredded cheese | Tomato sauce |
| Herbs | Marshmallows | Chocolate chips |
| Pumpkin puree | Corn | Black beans |
| Sugar | Spices |  |

**Potions Class: Slime!**

Make 2 solutions:

1 part glue + 1 part water

1 Tbsp borax + 1 cup water

Method 1: dump glue mixture into Borax solution, then lift it out with your hand and knead it together

Method 2: add spoonfuls of Borax solution (1 at a time) to the glue mixture and stir