Mud Hole
ROD BUILDING & TACKLE CRAFTING

EDUCATION PROGRAM

BASIC ROD BUILDING LESSON PLAN

Basic Rod Building Course

Objective: Students will learn the process of custom rod building and the mechanics behind fishing rods.

Resources

- Mud Hole Education Program Rod Kit.
- Mud Hole Education program instructional videos.
- Lesson matching Google Slide teaching resource, link below.
- Rod Building Lesson Plan Slides
- Rod Building tools/building equipment.

Note To Educators

-Thank you for choosing to use our Education Program. This lesson plan is intended to help aid teachers in utilizing our rod building kits in the classroom. This specific lesson plan is for basic rod building and will be a great resource to use when planning for your classes. For any additional questions or concerns please contact the Education Department coordinator, Anthony Youmans, anthony@mudhole.com.

Lesson 1 – Kit Breakdown

Objective: Students will identify the different components of a fishing rod and the application of each part.

Resources

- Education Program rod kit
- Teachers resource Google Slide

Warm-Up

1. Utilizing the teachers resource slides, have students play a guessing game with rod parts to activate prior knowledge and see if they can line up the parts in the correct order and orientation.

ex: Work in a group to layout the blank with correct components.

Instruction

1. Using slides, go over each rod part and the purpose of each.
2. Show finished or built rod so students can see what they will be making.
3. Go over common mistakes that can be made and see if students can identify the negative impact these mistakes can have.

ex: What do you think the line will do if a guide is not lined up correctly, wrong size, too loose, etc.

Wrap-Up

1. Using the lesson 1 slides, show students a brief overview of the whole rod building process so they can see pictures of what is to come.

Lesson 2 – Finding the Spine

Objective: Students will be able to identify and feel the spine of their blank, as well as understand the purpose of the spine.

Resources

- Teachers resource slides
- Rod Blank
- Tape (optional visual aid for teacher)
- Grease Pencil

Warm-Up

1. Show video in Lesson 2 slides that explains what the spine of the blank is and its importance.

Instruction

1. Have students identify and take out their blank and grease pencil.
2. Have the students place the blank on a table or on the floor.
3. Carefully place one hand at the top of the blank and the other in the middle of the blank.
4. Bend the rod slowly until the blank has a thorough flex. Do not bend the blank past 90-degrees.
5. While holding at an angle, slowly roll the blank using the hand in the middle of the blank, it will snap into a location creating resistance to roll it further.
6. Apply a length-wise mark on the blank with your grease pencil at the found point of resistance. This is the location the blank wants to flex. **Note:** If you are building a **spinning rod** you will mark the inside of the bend and if you are building a **casting rod**, mark the outside of the bend.

Wrap-Up

1. Walk around and ensure that the students located the spine of the blank and appropriately marked it.
2. Lead a class discussion about what could happen to the blank if the spine is not located correctly.

Note to Educators

-The spine of the rod is actually the backside of the blank where it arches and it is a lot like the spine of the human body when picking something up off of the ground. This is a great way to visualize this part of the rod building process to students. All of your guides and components will want to line up with the spine of the blank. Please note that if you are building a spinning rod, the mark you make on the blank will be on the INSIDE of spine and if building a casting rod, the mark will be ON the of the spine (outside of bend) of the blank.

Lesson 3 – Handle Placement and Reaming

Objective: Students will prepare their handles for the rod build by learning and executing handle reaming.

Resources

- Teachers Resource slides
- Education Program handle kit
- Handle Reamers
- Drills (if using Extreme Reamers)
- Grease Pencil
- Blank

Warm-Up

1. Stand up or lay the blank on a table, have students lay out their handles where they would go alongside the blank.
2. Play handle reaming video so students can see the process.

Instruction

1. Have students keep the rod blank on the table and mark with a grease pencil where the handles and reel seats will go on the blank.
2. Before reaming, have students dry fit the components to the marks they made on the blank. ***NOTE** the components will not slide all the way to the marks yet, this step is to show students how much material they need to ream out the handles.
3. Starting with the rear grip, have students slowly ream out their handles so they fit to the marks on their blank.

Wrap-Up

1. Again, have each student slide on all of their handle components and reel seat so you can check to see if their components line up to the marks made on the blank.

Note to Educators

-Handle reaming is extremely important but also a very fragile process. Be careful as you ream out your components. Ream a little and check often. Cork is much delicate than EVA so make sure to not apply too much force. You want the handles to be slightly snug. To check this, you can use the two-finger rule **(using index and thumb slide down the grips, if they require more force than what two fingers can give then ream out a little more material).** The best reaming tool we have are the Extreme Reamers. They are reamers that can be chucked into a drill and be used under power. Using extreme reamers in combination with a drill will cause the reamers to heat up, after reaming each grip check the temperature and if it is hot to the touch, swap that reamer for a cool one while the temperature goes down. Watch extreme reamer video for reference

Lesson 4 – Prepping Epoxy and Installing rear grip

Objective: Students will learn how to mix epoxy and install their rear grip.

Resources

- ProPaste epoxy
- Mixing dish
- Popsicle sticks
- Rear grip
- Blank
- Paper towels
- Rubbing alcohol

Warm-Up

1. Have students lay out all of their materials, epoxy, mixing dish, popsicle sticks, etc.
2. Play the prepping epoxy and rear handle installation video.

Instruction

1. Have students scoop out a 1 to 1 ratio of the ProPaste epoxy and mix it into the dish (mix until the two parts are one complete color)
2. Once the epoxy is mixed, have students hold their blank up and find the mark they made with the grease pencil in the previous lesson.
3. Start at the first line nearest the butt of the blank that you made for the rear grip and apply a thin coat of the epoxy all the way down.
4. Slide the read grip down the blank and make sure to rotate the grip as you make contact with the epoxy.
5. Clean off any excess epoxy using paper towels and rubbing alcohol.

Wrap-Up

1. Have each student clean up and remove any epoxy from their hands and work station.
2. Walk around and check to make sure their rear grips are flush with the butt of the rod blank.

Note to Educators

-Make sure to keep the epoxy contained and do NOT get it on any clothing. Spinning rods will have one tenon that needs to be at the bottom of the blank. Casting rods will have two tenons (the thinner tenon on a casting rod will be at the butt of the rod blank). If students make a mess with the epoxy make sure to have them use rubbing alcohol to remove any remaining epoxy before washing their hands.

Lesson 5 - Arbor reel seat and handle assembly

Objective: Students will learn how to create tape arbors and install the rest of their handle components.

Resources:

- Half inch masking tape
- Rod Blank
- Reel seat
- Foregrip
- Epoxy
- Mixing dishes
- Mixing sticks

Warm-Up

1. Have students watch the arbor and handle assembly videos.
2. Have students lay out their materials to prepare for the lesson.

Instruction

1. Start by having the students find their marks on the blank where the reel seat and foregrip are going to go.
2. Begin wrapping the tape arbors (see video for reference) at three different locations within reel seat mark.
3. First tape arbor will be a finger width from the rear grip, the second arbor one finger width from the foregrip mark, and one in the middle splitting the distance.
4. Build up the arbors so they are the same thickness and dry fit the reel seat to make sure it fits smoothly over each arbor on the blank with no wobbling.
5. Prepare the epoxy like in the previous lesson (see epoxy prep video for reference)
6. Wrap a strip of tape at the base of the reel seat to cover the threads preventing epoxy from coming in contact with the reel seat. Fold tape over to create a pull tab to easily remove tape.
7. Spread the epoxy on all three tape arbors and make sure to not have too much excess epoxy on the arbors. The epoxy must completely encapsulate the tape arbors.
8. Next, slide the reel seat down the blank and rotate the reel seat as you slide it over the arbors (if there is excess epoxy use paper towels and rubbing alcohol to clean)
9. Then apply a thin layer of epoxy between the marks for the foregrip and slowly rotate the grip down until it is flush with the reel seat.
10. Once you have your reel seat and grip on the blank line up the reel seat logo with your spine mark made in step one.
11. Finally, apply a small amount of epoxy inside of the butt cap and rotate it onto the tenon of the rear grip.

Wrap-Up

1. Clean up the students work space and make sure there is no visible epoxy on the components.
2. Run a continuous strip of tape from the foregrip down to the butt cap and back up the other side of the handle section to hold the components in place while the epoxy dries.

Note to Educators

-With the tape arbors, make sure all students are putting all of their tape arbors inside the correct mark, which will be under the reel seat when applied. You want the reel seat to be slightly snug, you do not want the reel seat to be forced over the tape arbors. Make sure the tapered end of the foregrip is pointing toward the tip of the rod. Be sure to have the work environment clean with no epoxy remaining on components or on the working station.

Lesson 6 – Guide Prep (Optional)

Objective: Students will learn about what their guide train will be and prepare their guides to be wrapped onto the rod.

Resources:

- Guide set
- Sandpaper/Emory cloth

Warm-Up

1. Have students line up their guides from smallest to biggest and lay them out.

2. Play the guide prep video so they can see what they will be doing.

Instruction

1. Have students sand down each tip of the guide foot like in the video.

Wrap-Up

1. Go around and check each students guide foot to make sure they are sanded down correctly.

Note to Educators

-This step is optional and not always necessary however it does teach students what a guide train is and can help students new to rod building wrap their guides more efficiently. The objective of this step is to create a smooth transition from the blank to the guide foot. This allows an easier wrap because the thread is able to walk up the guide foot frame easily.

Lesson 7 – Winding check and Guide Tubing

Objective: Students will identify and fasten their winding check onto the rod blank. They will also prepare the guide tubing for the blank.

Resources:

- Winding check
- Guide tubing
- Razor blade
- Rod Blank

Warm-Up

1. Have students take out their materials and identify the winding check, guide tubing, etc.

2. Play the winding check and guide tubing video so students can see what they will be doing.

Instruction

1. Have students hold out their winding check and make sure the winding check is facing the correct direction (wider part facing down toward the butt of the rod)

2. Slide down the winding check so that it is flush with the foregrip.

3. Next, have students move onto the guide tubing and have them cut small 10^{th} of an inch pieces for each guide they will put on the rod.

4. Finally, slide the guide tubing onto the blank so they are ready to be used when putting on the guides.

Wrap-Up

1. Walk around and make sure students have their winding check on correctly and the appropriate amount of guide tubing pieces on their blank.

Note to Educators

-The winding check does not need epoxy to stick to the blank. Since they are rubber, they will stretch and stay attached to the rod easily. The guide tubing is used to hold the guides onto the blank while the students wrap them. To be safe, you can have the students cut extra pieces if needed. You can cut the guide tubing slightly thicker for first couple guides on a spinning rod, these guides will be bigger and heavier than the rest.

Lesson 8 – Installing Tip Top

Objective:

-Students will identify their tip top guide and learn how to install it onto the rod.

Resources:

- Rod blank
- Tip Top
- Tip Top glue
- Razor Blade
- Plyers
- Lighter

Warm-Up

1. Have students take out all of their materials and identify the tip top.

2. Play the installing tip top video so they can see what they will be doing.

Instruction

1. Have students take out the tip top adhesive and cut a small sliver of the adhesive so they can insert it into the tube of the tip top.

2. Next, have students grab the frame of the tip top with plyers and using the lighter, heat up the tube until the adhesive is liquifies (3-4 seconds).

3. Then, once the adhesive is liquid, fasten the tip top to tip of the rod blank.

4. Once the tip of the blank is inserted into the tube, rotate the tip top 2-3 times to spread the adhesive.

Wrap-Up

1. Walk around and make sure the students' tip top ring is lined up with the logo of the reel seat.

Note to Educators

-Make sure the students are holding the tip top by the frame with the plyers. If they are holding the top by the ring or the tube, damage may occur to the integrity of the tip top. In addition, when holding the flame to the tube of the tip top ensure that the students do not have the tube facing down because the liquified adhesive could seep out. Finally, it is very important to have the tip top ring lined up correctly and facing the logo of the reel seat. The glue gun technique in installing tip top video works great as well.

Lesson 9 – Guide Spacing

Objective

-Students will learn where their guides will go on the blank and how to measure the distance between them.

Resources

- Blank
- Grease pencil
- Guide set kit
- Tape measurer
- Guide tubing

Warm-Up

1. Have students take out their materials and lay their blank on the table.

2. Play the guide spacing video so they can see what they will be doing.

Instruction

1. Have students lay the tape measurer down next to the rod and line up zero with the tip of the rod blank.

2. From there, grab the guide set and china marker (the guide set will have spacing included on the back of the kit).

3. Starting from the tip, put a mark with the grease pencil at each location given on the guide spacing chart.

4. Now that you have your marks on your blank, slide one or two guide tubing pieces below each mark.

Wrap-Up

1. Walk around and make sure all the students have the correct marks all along the rod blank.

Note to Educators

-Please note that some guide sets will have spacing for three different rod blanks. Make sure the students are following the correct spacing for the length of the rod they are building. Some of these marks might rub off in the following steps, keep the grease pencil and tape measurer handy during the rest of the process. The students only need one piece of guide tubing for each guide but it is a good idea to have extra ready.

Lesson 10 – Hand wrapper thread set up and guide wrapping

Objective

-Students will learn how to set up their hand wrapper with thread and wrap a guide.

Resources

- Hand wrapper
- Thread
- Burnishing tool
- Razor blades
- Guide set
- Blank

Warm-Up

1. Have students lay out all of their materials for the lesson.

2. Play video of thread set up and guide wrapping so students can see what to do.

Instruction

1. For this lesson, rely heavily on the video in the PowerPoint to explain hand wrapper thread set up (see video for instruction).

2. Place the rod blank onto the stands and prepare to wrap the first guide.

3. Again, rely on the video to explain and prepare for the wrapping the guides.

Note to Educators

-The pull loop used in the video is created from spare thread at the start if the guide wrap demo. Please keep in mind, when wrapping guides, tension on the thread is the most important part. If tension is lost while wrapping the guide, the guide wrap will become loose and will have to be redone. You will need to adjust your thread tension using the wing nut/ knob. Once you find good tension, the adjustment will be minimal. The slider allows you range of motion and the wrapping of a guide anywhere on the wrapper. Moving the slider is common and necessary to achieve clean wraps.

Lesson 11 – Mix and Apply Finish

Objective

-Students will learn how to mix and apply their tread finish to the guide wrapping.

Resources

- Wrapped rod blank
- Dryer
- SCIK (Instructors Kit, see individual pieces below)
- Mixing cups
- PK-8 Thread Finish
- Yellow finishing brushes
- Mixing Sticks
- Epoxy Syringe Inserts

Warm-Up

1. Have students take out all of their materials including the instructors kit with the listed parts above.

2. Play the mix and apply finish video so students can see what they will be doing.

Instruction

1. Have students straighten any guides that are not in line with the reel seat logo according to lesson 11 video.

2. Remove any excess grease pencil markings from blank using spare sections of wrapping thread.

3. Put the handle of the wrapped rod blank into the rubber cup of the dryer and turn it on.

4. Unpackage the PK-8 thread finish and remove the lids so the red plungers can be taken out of the bottles.

5. Insert the syringe insert into the top of the epoxy bottles.

6. Set up a mixing cup for each student that is ready to apply finish.

7. Portion out 3 ml of each part of the thread finish into the mixing cups.

8. Mix finish slowly for 5 minutes.

9. Once thread finish is mixed use the brushes to apply the finish to the first guide wrap (starting with the largest guide).

10. When applying finish to the thread wrap, start at about an 8^{th} of an inch before the thread on the blank. This will ensure that the thread wrap is watertight on both ends and sealed to the blank. Then coat all of the thread wraps with a moderate amount of finish.

11. Once you have applied finish to each guide wrap, apply a thin coat at the tube of the tip top where it meets the blank. Allow the rod to rotate for 4-6 hours while the thread finish cures.

Wrap-Up

-Walk around and check students workstations to make sure the rods are turning and everything is cleaned up.

Notes for Educators

-Steps 1-6 can be performed by the teacher and the thread finish cups can be handed out to the students, this will ensure minimal measuring errors. Please note that the epoxy has to be mixed **EXACTLY** to a 1 to 1 ratio. When mixing the thread finish make sure to rotate the mixing sticks slowly as to not introduce air bubbles into the epoxy. A good rule of thumb is to mix clockwise for one portion, and then counterclockwise for another portion. Also make sure that the students mixing sticks are making contact with the bottom of the cups and occasionally scrap the sides so that the finish thoroughly mixes. Finally, please note that the rod will have to rotate in dryer for 6-8 hours while epoxy cures. It is advised that each student keep their leftover finish cups with the rods, this can be used to check the dryness of the finish without touching the finish on the thread wraps. It is most common to allow these rods to rotate overnight, if this is the case, please ensure that the classroom power will not be shut off at any point.