DIVE Biology

Lab Instructions & Supply List by Lab

IMPORTANT: Follow the instructions on page 2 for every lab.

Using your own lab supplies instead of the DIVE Lab Kit? Follow the instructions in this guide on which labs to attempt hands-on. A list of materials needed for each lab is on page 2. Then purchase the individual items here: **NWP Lab Supplies**.

The **DIVE Biology Lab Kit** can be purchased at **Nature's Workshop Plus.** Except for the items in the Supplies You Provide below, the lab kit contains all the equipment and supplies to do 22 of the 28 labs. Dr. Shormann chose the best college preparatory labs, NOT the safest labs. Please take the necessary safety precautions when completing all lab activities. FAQs: Lab Supplies & Kits

Instructions for Labs Not Completed Hands-On

Labs 4, 6, 9, 12, 23, and 28

These labs require very expensive equipment or chemicals that are restricted by Federal Law. To complete these labs:

1. Watch the video lab and fill in the corresponding activity pages in the DIVE Lab Workbook.
2. Grade and correct the lab activity sheets using the video solutions at the end of the video lab.
3. If the lab is completed and corrected, a grade of 100 is awarded. For details, see Labs in the DIVE Teacher Guide.

Instructions for Hands-On Labs

Labs: 1, 2, 3, 5, 7, 8, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, and 27

Follow Dr. Shormann's instructions carefully. If the experiment doesn't work, it's okay! You are learning important skills, which take time and practice to develop.

1. Important: Do not use the supply list in the lab workbook - see #2 below.
2. Find the lab in the chart below (page 3). Read the "Special Instructions" and gather the supplies listed there.
3. Before attempting the lab hands-on, watch the video lab (but don't fill in lab manual).
4. Complete the lab hands-on while watching the video lab again. This time, fill in the DIVE Lab Workbook pages. Pause and rewind the video as needed.
5. Watch the video solutions at the end of the video lab and correct missed problems.
6. For detailed instructions and grading, see the Labs sections in the DIVE Teacher Guide.

If you have any issues with the Lab Kit, contact Nature's Workshop

Supplies You Provide - Not Included in the Lab Kit

- **Optional: Microscope**
  A microscope is not included in the lab kit. The video lab shows detailed images of the slides in Dr. Shormann's high powered microscope so a microscope is not required. If you do not use a microscope, you may want to use NWP's "Build Your Own Kit" and purchase everything except the slides.

  If you want to use a microscope, you can use any microscope with a light and 40x, 100x, and 400x magnification and is designed for use by high schoolers. **Dr. Shormann recommends this one:** Monocular Cordless LED Microscope - 131-RLED

  However, because the DIVE Biology lab videos include images of the slides in Dr. Shormann's high powered microscope, you can save money by using a lower quality microscope designed for middle schoolers as long as it has 40x, 100x, and 400x magnification and a light. This allows the student to learn to use a microscope at a lower price point. Nature's Workshop Plus has this one: Monocular Cordless LED Microscope - 109-LED

  Another option is a digital microscope with a minimum 40x - 400x magnification. Digital microscopes do not have eye pieces. While some include a screen, the more economical options ($60-$100) require a device like a phone, tablet, or computer to view the slide. Keep in mind the student needs to watch the video lab while viewing the slides which means they need two devices for labs that use a microscope. Here is an example: AmScope

- Anacharis - a live aquatic plant that cannot be included in the kit. However, it is available at most pet stores that sell fish.*
- Banana
- Calculator (Graphing or Scientific)
- Duct Tape
- Distilled Water
- Ice
- Onion
- Paper Towels
- Permanent Marker
- Pond Water
- Potato, 1 large
- Potato Peeler or knife (use in place of Cork bore #2)
- Spinach Leaf
- Sow or Pill Bugs (Live) - Lab 11: Catch them, purchase at NWP*, or watch the video lab for this part.

- Sucrose = Table sugar, white, 1 cup
- Print out of of sponges and cnidarians
- Print out of Color Vision Test
- Print out of Respiratory and Digestive System Reference Chart
- **Spreadsheet Application**
  Several labs require a spreadsheet application like Microsoft Excel or Apple Numbers. Google Sheets and Openoffice (www.openoffice.org) are free spreadsheet applications which can also be used.

*__Live Materials__ (for Labs 5, 13, 17) must be mailed within a few days of use and cannot be included in the kit. You can either purchase them (see Supplies You Provide below) or the student can watch the video lab for the parts involving live materials.

Important: Instructions & Supplies by Lab

Lab #	Supplies In Kit	Supplies You Provide & Important Instructions
1	Preserved Slide Desmids Preserved Slide Crossed Threads Economy Magnifiers (Hand Magnifying Lens)	Microscope
2	*None*	Computer with Spreadsheet Application (see Important Notes above)
3	Dialysis Tubing Iodine Solution (Iodine Tincture)* *Save for Lab 5 100 ml Starch Solution, 1%* 100 ml Glucose Solution, 15%* 6 Clear Plastic Cups, 16oz Beakers, glass, 150ml Ruler Stir Rod Glucose Test Strip Eyedropper (In Dissecting Kit) Graduated Cylinder, 10mL and 100 mL Digital Scale (Balance) *See Special Instructions to the right.	Distilled Water Spreadsheet Application (see notes above) Potato Table sugar, 1 cup (sucrose = table sugar) Knife or potato peeler (instead of Cork bore #2) *Special Instructions: The video lab instructs you to create solutions of sucrose, starch, and glucose. However, the lab kit provides pre-made starch and glucose solutions. Simply follow the instructions in the video as if you had made the solutions as instructed. The video will tell you how much of each solution to use and how to use it. For sucrose, follow video lab instructions for making your concentrations.
4	Follow the steps on page 1 under “No Hands-On Lab”.	
5	Slides and Coverslips Set* Concave Slide Set* Eyedropper (In Dissecting Kit) Methylene Blue Iodine Solution (From Lab 3) Cotton Swabs Scalpel (In Dissecting Kit) Forceps (Tweezers -In Dissecting Kit) Pointed Probe	Microscope Onion Banana Anacharis (*Available at local pet store with aquarium supplies*) Water *Wash and save for future labs
6	Follow the steps on page 1 under “No Hands-On Lab”.	
7	PART 1: Follow steps for Hands-on Labs with included lab supplies. Preserved Slide Allium (Onion) Root Tip Slides and Coverslips Scalpel (In Dissecting Kit) Pointed Probe Eyedropper (In Dissecting Kit) Whitefish Blastula Slide *	

	*This slide is not in the kit. Use the slide images in the video lab. PART 2 and up: Follow the steps on page 2 to complete using the video lab.	
8	*None*	Calculator
9	Follow the steps on page 1 under “No Hands-On Lab”.	
10	PTC Paper Index Cards (To make your own Allele Cards)	Calculator
11	Choice Chamber Filter Paper	Water Live Sow or Pill Bugs* *If you don’t have live bugs, watch the video lab and complete the lab manual. See “Live” on page 2.
12	Follow the steps on page 1 under “No Hands-On Lab”.	
13	Concave Slides* Coverslips* Eyedropper (In Dissecting Kit) Methyl Cellulose Preserved Slide Mixed Protozoans Preserved Slide Marine Diatoms	Distilled Water Pond Water Microscope *Wash and save for future labs
14	Preserved Slide Rhizopus Preserved Slide Penicillium Preserved Slide Coprinus, cross-section Preserved Slide Lichen, cross section	Microscope
15	Note: Soak peas 2 days in advance. Glass Vials Rubber Stoppers Metal Washers Graduated Glass Pipettes, 2ml 100ml Graduated Cylinder Dry Pea Seeds Plastic Beads Cotton Balls Rayon Balls Potassium Hydroxide Solution(KOH) Silicon Sealant Stir Rod Thermometer Safety Goggles	Duct Tape Ice Water Paper Towels Permanent Marker

16	Watch the video lab for the science experiment in the first part titled "Of the following variables, heat/light, wind, ..." Use the following lab supplies to complete the 2nd part titled "Observing cells involved in transpiration." Ranuculus slide (root and stem) Slides and cover slips** Tweezers (In Dissecting Kit)* Eye Dropper (In Dissecting Kit)* Dissecting Scissors (In Dissecting Kit)*	Spinach leaf Water *Wash and save for future labs **Use to make spinach slide
17	Preserved Slide Grantia (c.s. and l.s.) Preserved Slide Spincules Preserved Slide Hydra Concave Slides* Cover Slips* Eyedropper (In Dissecting Kit)	Microscope (or use images on video) Water Print out of Photographs sponges and cnidarians **Wash and save for future lab
18	Preserved Earthworm Dissection Tool Kit Dissection Pan and Flex Pad* Gloves Economy Magnifier (Magnifying Lens)	Microscope (or use images on video) *Wash and save for future lab
19	Preserved Crawfish Dissection Tool Kit Dissection Pan and Flex Pad* Gloves Economy Magnifier (Magnifying Lens)	Microscope (or use images on video) *Wash and save for future lab
20	Preserved Grass Frog Dissection Tool Kit Dissection Pan and Flex Pad* Gloves Economy Magnifier (Magnifying Lens)	Microscope (or use images on video) *Wash and save for future lab
21	Preserved Fish (Perch) Dissection Tool Kit Dissection Pan and Flex Pad* Gloves Economy Magnifier (Magnifying Lens)	Microscope (or use images on video) *Wash and save for future lab
22	Preserved Fetal Pig Dissection Tool Kit Dissection Pan and Flex Pad* Gloves Economy Magnifier (Magnifying Lens)	Microscope (or use images on video) *Wash and save for future lab.
23	Follow the steps on page 1 under “No Hands-On Lab”.	

24	Slide Human Skin c.s. Slide Human Stomach c.s. (involuntary) Slide Heart Muscle (cardiac) Slide Straited Muscle (voluntary)	
25	Lung Volume Bag Human Anatomy Torso	Respiratory and Digestive system reference chart http://creationwiki.org/Respiratory_system
26	**Part 1 Human Blood and Blood Typing*** Human blood slide Human ABO Blood Typing Kit	Microscope Spreadsheet Application (see notes above) *Complete Part 1 with included lab supplies. Complete remaining part(s) by watching the video lab.
27	Reflex Hammer (Rubber Mallet) Penlight (Flashlight)	Banana Color Vision Test