

AP Biology Lab Materials: AP Biology A

The following items will be needed to complete the required hands-on and laboratory activities for AP Biology:

General Supplies:

Lab Investigations Notebook (your choice on notebook format)

Pencils/erasers and Pens

Colored Pencils

Metric Ruler

Graph Paper

Lab Safety:

Safety Goggles

Safety goggles should be Chemical Splash safe and say
“Meets ANSI Z87.1 Standards”

Gloves

Use disposable latex gloves when handling chemicals or items you might be sensitive to (bacteria, etc.). If allergic to latex, choose instead either nitrile or vinyl gloves.

Working with plants

Identify plants before collecting. Do not collect endangered/threatened species.
Avoid poison ivy and other plants with skin irritants.

Working with animals

There are many important ethical scientific regulations regarding humane animal Care. You may be working with invertebrate animals, such as insects.
Follow all humane animal care protocols included in the lab procedure.

Lab Materials: Unit 1 - Nature of Science

Build a Tree Lab:

Laboratory Investigations Notebook

Internet access - NOVALabs - Evolution Lab.

Lab handout worksheet - NOVALab - Evolution Lab: Missions 1 & 2

Gummi Bear Lab - Scientific Practices:

Laboratory Investigations Notebook

Gummi Bear Lab Instructions

AP Biology Lab Report Rubric

Materials: (dependent upon your focus question):

Gummi bears (color variety)

Beakers or cups

Water

Mass scale, triple beam balance or home food scale (measure mass in grams, if possible)

Other possible materials (dependent upon focus question)

Sugar

Scientific Thermometer (measure temperature in degrees centigrade, if possible)

Kitchen knife

Lab Materials: Unit 2 - Evolutionary Biology

Artificial Selection Lab (modified from AP Biology student investigative lab manual)

Laboratory Investigations Notebook

AP Biology - Artificial Selection Lab (modified version)

AP Biology - Artificial Selection Lab (student lab manual)

AP Biology Lab Report Rubric

Mathematical Modeling Hardy-Weinberg Lab (AP Biology student investigative lab manual)

Laboratory Investigations Notebook

PreLab Concept Review:

Pearson Lab Bench - Population Genetics & Evolution (concept review)

Population Genetics and Evolution Lab video (5:59, Bozeman Science)

Hardy-Weinberg Punnett Square (Bozeman Science, 8:31)

Population Modeling (Bozeman Science, 10:39)

Lab Instructions:

Hardy-Weinberg Lab Instructions (modified version)

AP Biology - Mathematical Modeling Hardy-Weinberg Lab (student lab manual)

Spreadsheet program such as Microsoft Excel or Google Sheets

AP Biology Lab Report Rubric

Lab Materials - Unit 3 - Biochemistry

Properties of Water Lab

Laboratory Investigations Notebook

Lab Instructions:

Properties of Water Lab

Materials: table salt, water, measuring cups/spoons, 2 pennies, 2 pipets, paper towels, food coloring, celery, metric ruler, razor blade, graph paper or create a graph online (MS Excel, Google Sheets, etc.)

Lab Materials - Unit 4 - Cell Biology

Diffusion and Osmosis Lab:

Laboratory Investigations Notebook

Lab Instructions:

AP Biology - Diffusion and Osmosis Lab (modified version)

AP Biology - Diffusion and Osmosis Lab (student lab manual reference)

AP Biology Lab Report Rubric

Materials: Distilled Water, Unflavored gelatin, Red Cabbage, Baking Soda. White Vinegar (acetic acid), Sucrose (table sugar), Salt, Ovalbumin (raw egg white protein), Potato.

Glucose tablet (available from drugstores, as used by diabetics)

Elodea (aquatic plant tissue, available from pet/aquarium stores or school aquariums)

Dialysis Tubing (contact your school district science teachers for this supply or purchase online or at a drugstore as a home science supply)

Lab balance or Kitchen scale (measure in grams, if possible)

Graduated Cylinder or Measuring cups with metric ml marks

Beakers or kitchen containers

Kitchen Blender

Metric Ruler

Online tutorial tools:

Lab Bench Activity - Diffusion and Osmosis

AP Biology Lab - Osmosis and Diffusion

Create Your Own pH Indicator

Elodea plasmolysis

Lab Materials - Unit 5 : Cellular Energetics

Enzyme Substrate Model Activity

Laboratory Investigations Notebook

Lab Instructions:

Enzyme Substrate Model Activity

Materials:

Pennies (50)

Masking Tape

Stop Watch

Small ball (golf ball, ping pong ball, etc.)

Partner (friend, sibling, parent or teacher)

Enzyme Lab

Laboratory Investigations Notebook

Lab Instructions:

AP Biology - Enzyme Activity Lab (modified version),

AP Biology - Enzyme Activity Student Lab (student manual, for reference)

AP Biology Lab Report Rubric

Online Tutorial Tools:

Pearson Lab Bench - Enzyme Catalysis

AP Biology Lab - Enzyme Catalysis (6:45. Bozeman Science AP Biology)

Materials:

Distilled water

Plant material (white potato, turnip, apple, rutabaga)

Baking Soda (to create pH buffer 1 solution)

White Vinegar (to create pH buffer 2 solution)

Hydrogen Peroxide (3 % solution from store, diluted to 1.5 %)

Measuring Cup with milliliter (ml) marks (or graduated cylinder)

Measuring spoons (or metric balance)

Test Tubes

Pipettes

Digital Camera

Photosynthesis Lab

Laboratory Investigations Notebook:

Lab Instructions:

AP Biology - Photosynthesis Lab (modified version),

AP Biology - Photosynthesis Student Lab (student manual, for reference)

AP Biology Lab Report Rubric

Additional references for review of the lab concepts include:

Pearson Lab Bench - Plant Pigments and Photosynthesis (review 4.2 Photosynthesis),

AP Biology - Photosynthesis and Plant Pigments (5:42, Bozeman Science)

Materials:

Baking Soda

Plastic syringes

Hole punch

Timer

Permanent marker

Liquid dish soap

Baby spinach leaves

Clear plastic cups

Light source (100 watt bulb)

Plastic dropper

Plant Pigments and Chromatography Lab

Laboratory Investigations Notebook:

Lab Instructions:

Plant Pigments and Chromatography Activity

Additional references for review of the lab concepts include:

Pearson Lab Bench - Plant Pigments and Photosynthesis (review 4.1

Chromatography),

AP Biology - Photosynthesis and Plant Pigments (5:42, Bozeman Science)

Chemistry of Changing Leaves (4:21, Science 360)

Why Do Leaves Change Color?

Materials:

Coffee filter paper (cut as shown in the diagram in instructions)

Scissors

Spinach leaves

Coin

Rubbing alcohol
Jar
Pencil
Tape
Foil
Metric ruler

Lab Materials - Unit 6 : Cellular Reproduction

Karyotype Project

Karyotype Project (Instructions & grading rubric)
The Biology Project Karyotyping Activity website (Instructions & 3 patient case studies)
Presentation - Select a multimedia presentation format for your project report

Modeling Mitosis Lab

Laboratory Investigations Notebook:
Lab Instructions:
Modeling Mitosis & the Cell Cycle - Lab Activity
Mitosis template
AP Biology Student Lab 7: Cell Division Mitosis & Meiosis. Read pages S83-S86 for background information on the cell cycle and regulation of the cell cycle.

Materials:

Pipe cleaners in 2 colors and cut to 3 sizes = Chromatids (condensed DNA)
Pink = maternal and Blue = paternal (note - you can use any 2 colors)
Beads = centromeres (recommend colored "pony beads" with holes in center)
Black Marker
String or Paper (for creating nuclear membranes and/or cell membrane circles large enough to include your chromatids)

Meiosis Model Self-Assessment

Laboratory Investigations Notebook:
Lab Instructions
Self-Assessment: Modeling Meiosis
Meiosis template
AP Biology Student Lab 7: Cell Division Mitosis & Meiosis. Read pages S94-S95 for background information on meiosis.

Materials:

Note - use the materials from the Modeling Mitosis Lab activity (above)

Lab Materials: Unit 7 - Molecular Genetics

DNA Extraction Lab

Laboratory Investigations Notebook

DNA Extraction Lab

AP Biology Lab Report Rubric

Materials and Equipment

- Measuring cup
- Measuring spoons
- Rubbing alcohol
- salt
- water
- dishwashing detergent (Dawn®)
- Glass or small bowl
- Cheesecloth
- Funnel
- Tall drinking glass
- Meat tenderizer
- DNA source: bananas, peas, broccoli, spinach, or strawberries
- Resealable plastic sandwich bags
- Test tube or small glass jar
- Bamboo skewer
- Blender

Restriction Enzyme Lab

Laboratory Investigations Notebook

AP Biology Lab Modified Version: Biotechnology - Restriction Enzyme Analysis of DNA
(modified for home lab)

AP Biology Lab: Biotechnology - Restriction Enzyme Analysis of DNA
(student manual, for reference)

AP Biology Lab Report Rubric

Metric Ruler

Semilog Graph Paper

CSI Wildlife and CSI Wildlife Worksheet 1

Lab Materials: Unit 8 - Heredity

Fruit Fly Genetics Virtual Lab

Laboratory Investigations Notebook
Fruit Fly Genetics Virtual Lab (student instructions)
Pearson Lab Bench: Genetics of Organisms
Chi-Squared Test (Bozeman Science, video tutorial)
AP Biology Lab Report Rubric

The Mating Game Lab

Laboratory Investigations Notebook
The Mating Game Lab (student instructions)
The Mating Game: Problem Worksheet

Materials & Equipment:

Allele tokens made out of (as per instructions);:

- US Pennies (approximately (170)
- Adhesive Round colored stickers in 4 colors (Avery product #5468)

Bowls or Solo cups (to hold allele tokens)
Printed game boards - Three 8 1/2" x 11" paper panels A, B & C (see #1 below)
Printed Problem Worksheet (see #2 below)
One standard 6 sided dice

Printed game boards - Three 8 1/2" x 11" paper panels A, B & C (see #1 below).
The Mating Game playing board(s), are available at:
Mating Game - Panel A - Single Locus Version
Mating Game - Panel B
Mating Game - Panel C - Two Locus Version