

FRST 386: Lab 1 Lesson Plan

| Activity | Instructor Activities | Learner Activities | Resources | Time (min) | Running Time |
|--|--|--|---|------------|--------------|
| Introduction | - introduce ourselves - brief outline of labs | | - hand out of salmonid family tree | 5 | 0:05 |
| Pre-test Activity - ask students "what they already know about fish in BC" - "how can forest practices affect fish populations?" | - write responses into overhead, ask leading questions | - respond to question, brainstorm | | 5 | 0:10 |
| Learning Objectives By the end of the lab students should be able to: | | | | 1 | 0:11 |
| <ul style="list-style-type: none"> Recognize the importance of taxonomic naming conventions. Label the <u>external morphological structures</u> of a fish. Define six different <u>morphological measurements</u> for determining fish size. Define: stock, population, anadromous, non-anadromous, catadromous, semelparous, and iteroparous. Describe the <u>salmonid lifecycle</u> and distinguish between anadromous and non-anadromous lifecycles. Recognize <u>differences in life history characteristics</u> of the seven <i>Oncorhynchus</i> spp. List three <u>methods commonly used to assess fish populations</u> and provide an example of a context in which each method could be used. | | | | | |
| Lecture Taxonomy Identification | | | | 9 | 0:20 |
| Fish morphology Activity Ask students to label their diagram with the features listed on overhead Work in a partner, group or solo | - go over answers after and discuss each body part and any relevant information | - students work in groups to label diagram | - morphology diagram handout | 10 | 0:30 |
| Group Activity (get students moving around a bit) Hand out the 4 cut out fish outlines and measuring tape. Tell students you will time them to see which group can measure the 6 fish measurements fastest. | - time groups | - students use tape to make the 6 fish measurements as fast as possible. | - fish cut outs for 4 groups | 7 | 0:37 |
| Lecture Definitions Salmon life histories Science in Action Methods for assessing fish populations | | | - handouts: salmon life cycle, pacific salmon life histories, methods for fish assessment | 40 | 1:14 |
| Activity In table groups, ask students to think of a context (research/conservation), pros and cons for each fish assessment technique | - walk around room and facilitate groups by asking questions, giving ideas - go over group responses and write notes on PPT | - work together to brainstorm ideas of when these assessment tools can be applied in the field | - scrap paper available | 26 | 1:40 |
| REVIEW QUIZ | | | | 5 | 1:45 |
| Science in Action | Mike describes tagging fish studies | | | 10 | 1:54 |
| Wrap-up, remind student of 'homework' for next lab | | | | | |

FRST 386: Lab 2 Lesson Plan

| Activity | Instructor Activities | Learner Activities | Resources | Time (min) | Running Time |
|--|---|--|-----------|------------|--------------|
| <p>Learning Objectives By the end of the lab students should be able to:</p> <ul style="list-style-type: none"> To define and identify three types of dorsal fin, four mouth positions, and three body shapes To identify the three <u>sub-families</u> of the family Salmonidae that occur in BC. To create your own key for identifying BC salmonids. <ul style="list-style-type: none"> To visually identify the freshwater forms of all BC salmon species in the <u>sub-family Salmoninae</u>. | | | | 1 | 0:01 |
| <p>Lecture expectations for learning in of fish taxonomy dorsal fins mouth types body shapes</p> | | | | 9 | 0:10 |
| <p>Interactive question: Ask students “why are salmonids so important”</p> | Facilitate student answers, write them onto ppt. | | | 6 | 0:16 |
| <p>Lecture - intro to family salmonidae - Corregoninae - Thymallinae</p> | | | | 5 | 0:21 |
| <p>Activity Create juvenile salmonid key</p> | Tell students the basics of a key and how to start, what to look for | Students work in groups of 2-3 to create their own ID keys | | 15 | 0:36 |
| <p>Lecture - Pacific salmon 5 spp.</p> | | | | 19 | 0:55 |
| <p>Activity Play movie and have students try to ID the moving fish</p> | Point out fish to identify on screen, help students identify key features | | | 3 | 0:58 |
| <p>Lecture Trout and char - feature SCIENCE IN ACTION clip</p> | | | | 40 | 1:38 |
| <p>Wrap-up, remind student of ‘homework’ for next lab - a few extra slides in case extra time to go through some examples and try to ID them</p> | | | | 10 | 1:48 |

FRST 386: Lab 3 Lesson Plan

| Activity | Instructor Activities | Learner Activities | Resources | Time (min) | Running Time |
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| Introduction Activity – REVIEW OF SALMONIDAE <ul style="list-style-type: none"> divide class into 2 teams give each team a copy of ID photos tell them to put together the phylogenetic tree for salmonidae family | - facilitate activity, help out if teams are off track...but mostly designed to be hands off, let the students do the work | - work as team using collective knowledge to assemble the tree | - laminated photos - sticky notes/paper - jiffy pens | 24 | 0:024 |
| Learning Objectives - To discuss the relationship between form and function in four fish orders. - To visually identify the 14 families of BC freshwater fish. | | | | 1 | 0:25 |
| Lecture Families: Scorpaeniformes, Cottidae, Perciformes, Centrarchidae, Percidae, Cypriniformes, Catistomidae | | | | 25 | 0:50 |
| Activity: Form and Function | - hand out sheet to class - Instruct students to try to fill out as much as possible using guesswork of form-function relationships - go over answers together and emphasize key points | - work in groups to discuss relationships between morphology and function. How do fish forms reflect the habitat they live in | - handouts | 20 | 1:10 |
| Lecture Families: Petromyzontidae, Acipenseridae, Clupeidae, Gasterosteidae, Osmeridae, Ictaluridae, Gadidae, Esocidae (broken up by film clips and random interactive short activities) | | | | 40 | 1:50 |
| REVIEW If time, go through the practice fish and help students with process of identifying key morphology traits in example exam-type questions | | | | 5 | 1:55 |
| Wrap-up, Remind students of long break before next lab. We will sign students up into their fieldtrip sections | | | | | |

FRST 386: Lab 4 Lesson Plan

| Activity | Instructor Activities | Learner Activities | Resources | Time (min) | Running Time |
|--|---|---|---|--|--------------|
| Go over logistics for field trip | - remind students that the next week is field trip. Confirm that the groups #1,2 are okay with people. | | | 10 | 0:10 |
| Activity – Fish ID game - in small groups students are given packets of photos of various fish that they must ID to family level using their notes and collective group brain. | - introduce activity, have fish photos divided into 6 groups of 6 photos/ group, hand out packets, mark each group as they finish on their accuracy of ID | - work together to review ID skills covered in fish families from last lab | - have prizes for top two teams | 35 | 0:45 |
| Lab 4 Learning Objectives <ol style="list-style-type: none"> 1. Apply information from previous lecture on fish families to identify a number of fish images to family-level. 2. Apply knowledge of riparian area management provided in legislative guidelines to a forest harvesting operation scenario 3. Identify key ecosystem and riparian features that are important considerations in a harvest operation and use problem solving skills to achieve a more conservation-appropriate 'site plan' for logging in a proposed watershed area | | | | | |
| Lecture - Introduce Riparian Area Management (why, how, history, importance) - introduce case study activity on redesigning site plans for forest harvest with objective for riparian management | - use PPT to go over main points that should guide students during group activity work | | | 15 | 1:00 |
| Activity: RMA case study - students work as a group to evaluate and re-design the timber harvesting site plan for a forestry operation in a complex watershed - students identify the 1) ecosystem features, 2) concerns with current operation plan 3) amend plan with RMAs and stream protection in mind - students present their work to the class and we discuss each groups plan | - facilitate the activity by making rounds during the group-work time and checking in with each group on their progress. - help keep students on task and suggest ways they can start the activity if they appear confused | - work as a group to apply concepts of Riparian area importance and management to an operational context - problem solve and come up with innovative solutions and alternatives to the current problematic scenarios | - 6 overheads with map printout - dry-erase pens - activity handouts - RMA management guideline booklets | 60mins 38mins – for group work, 22mins - for presenting | 2:00 |
| Wrap-up, - remind students of field-trip for following week and their paragraphs they have to write | | | | As they are packing up | |