Sustainable Resources 12: Agriculture

Module 4 Blackline Masters

This blackline master package, which includes all section assignments, as well as selected worksheets, activities, and other materials for teachers to make their own overhead transparencies or photocopies, is designed to accompany Open School BC's ***Sustainable Resources 12: Agriculture*** course. BC teachers, instructional designers, graphic artists, and multimedia experts developed the course and blackline masters.

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The Sustainable Resources 12: Agriculture course consists of five modules, the blackline master CD, a *Source File* for each module, and the *Sustainable Resources 12: Agriculture Companion Website*. Sustainable Resources 12: Agriculture is available in both print and online versions. Sustainable Resources 12: Agriculture components can be purchased individually or as a complete resource, the ***Sustainable Resources 12: Agriculture Resource Package***. All are available from Open School BC.

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Assign 4.1: Breeding and Feeding

As you learned in Lesson A, breeders select different breeds of cattle depending on the type of animal commodity to be produced. Now visit the **Module 4 Source File** and answer the questions below about breed selection for these animals.

1. Which commodity is produced from an Indian Runner duck?

    a. meat

    b. brown eggs

    c. white eggs

    d. blue eggs

2. Why would an egg producer choose to keep dual-purpose breed of chicken?

    a. The dual-purpose breeds are gentler.

    b. The dual-purpose breeds grow quickly.

    c. The producer would like brown eggs.

    d. (a) and (c)

3. If you wanted to start a large, intensive dairy operation, which breed of cow would be your best choice?

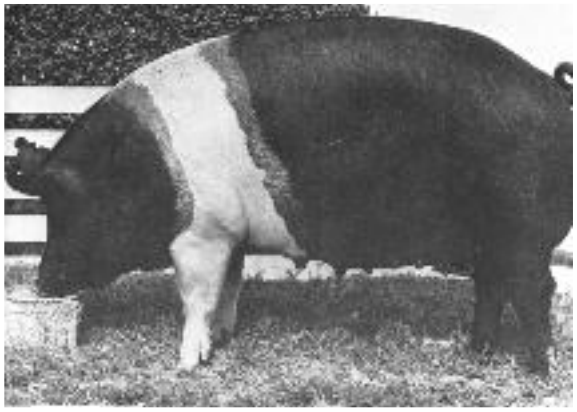
    a. Holstein

    b. Shorthorn

    c. Highland Cattle

    d. Jersey

4. Which swine is featured in this photo?



   a. Lacombe

   b. Hampshire

   c. Landrace

   d. Duroc

5. Which breed of swine would be the best selection if you are considering environmental sustainability?

   a. Hampshire

   b. Landrace

   c. Lacombe

   d. Yorkshire

6. Which is the most popular breed for egg producing poultry?

   a. Leghorn

   b. Rhode Island Red

   c. Plymouth Rock

   d. Barred Rock

7. Are egg producers smaller or larger in body than meat producers?

    a. smaller

    b. larger

8. This particular breed produces small litters, poor mothers, and passive breeders. What might a pork producer want to use this breed of swine for, given all of those drawbacks?

    a. crossbreeding

    b. keeping as a pet

    c. raising breeding swine

9. You're starting a small dairy farm catering to a specialty market: milk from pasture-fed cows. You are looking for a breed that will do well on the poor-quality forage you have available, and you would also like your cows to have a long production life—you won't have the money to invest in a new herd every four years. Which breed will you pick?

    a. Brown Swiss

    b. Holstein

    c. Ayrshire

10. You wish to have poultry on your farm suitable for egg producing but also a good choice for meat production. You see these three breeds at the auction today. Which breed do you choose?

    a. Plymouth Rock

    b. Rhode Island Red

    c. Leghorn

Assign 4.1: Breed Case Study
In this section, you will be researching information on your choice of one breed of cow, pig, or chicken.

Using the information on feeding from the lesson and your **Module 4 Source File**, create an illustrated report that describes the breed and its characteristics.

In particular, you will research the feeding and breeding methods best suited to your chosen breed.

Plan Your Research

- Make a list of places you might find information. If you have access to the Internet, visit the *Sustainable Resources 12: Agriculture Companion Website* (http://www.openschool.bc.ca/courses/agriculture/ag12v03/mod4.html) to visit the pages for associations that represent your chosen animal.

- If you decide to write or phone contacts for information, do so right away!

- If you decide to get information from the local library, look right away. Talk to a reference librarian if one is available. You may have to request books that are not in the library when you go there.

Evaluate Your Sources

- List the sources of information you plan to use in addition to the *Sustainable Resources 12: Agriculture* material. If you aren't sure yet, list at least three places you will look for information. Try to include at least one of each of the following:

    - Primary sources: This is research collected by you. If you talk to a producer working with your chosen breed, or if you go to observe your breed and take notes, these are primary sources
    - Secondary sources: This is research collected by others. The handbooks, articles, and other publications are secondary sources: they are work of others.

- Ask yourself if these sources are up-to-date.

- Ask yourself if the resources come from reputable sources. Livestock associations, 4H Clubs, and the BC Ministry of Agriculture are established sources of agricultural information that will be up-to-date.

You will need to include the following:

- An overview of your breed: when was it developed? Where? For what desired characteristics?
- feeding information
- breeding information

- an illustration or photo
- a page of works cited (be sure to include the Module 4 lesson and Source File)

How to Format Your Report
There are many ways you can present your report, but whichever method you choose, be sure the end product is both visually appealing and includes the information outlined above.

A report should use titles to break up the presentation of the information. Your information should be presented in paragraphs, and can include point-form information.

Some possible formats are:
- webpage
- word processing program
- slideshow presentation (e.g., PowerPoint) with text and/or narration

Using the Lesson Information
If you have chosen a breed of cow: Use the information provided in the cattle catalogue in the Module 4 Source File, as well as the Section 1 lesson content.

If you have chosen a breed of chicken: Use the information provided in the Module 4 Source File.

If you have chosen a breed of pig: Use the information provided in the Module 4 Source File.

Feel free to add any additional information for your particular breed that you have found in other sources. Be sure to include any resources you use in a Works Cited page.

Evaluation
The evaluation of your breed case study will be based on the following guidelines. Be sure to review these guidelines before you begin, and before you submit your case study, to ensure you have included all the required information.

Evaluation Guidelines
You have included an **overview of your chosen breed** within the species you have selected. 1 mark each for: (5 marks)

- Naming a specific breed.
- When was it developed?
- Where?
- For what desired characteristics?
- What is it used for today?

Physical description/characteristics of your breed. You have included at least five points of description. (5 marks)

You have included **feed information** for your chosen breed: what feed does your breed require, depending on the work the animal is doing? (3 marks) What are the best feeding methods for your breed? (2 marks)

Breeding information includes the following for your chosen breed: (1 mark each)

a. usual length of heat cycle
b. signs of estrus
c. actual servicing date
d. usual gestation period/ incubation
e. signs of approaching parturition/hatching

At least one labelled graphic is included, and referred to in the report. Diagrams or photos are clear and attractively presented. Images chosen are appropriate for the chosen breed. (5 marks)

Graphics taken from other sources have been properly cited to give credit to the original author/creator.

(1 mark deducted for each: incorrect breed shown in image, image not cited, image not labeled, image not referred to in the text of the report, image not displayed clearly)

A citations page is included—your report includes a list of the references you used in researching your topic.

(5 marks—1 mark deducted for each error or omission)

Total Marks
30

Assign 4.2: Breed ID

The colour of a cow isn't an important production factor, but it's fun to know what you're looking at when you drive past a herd in a field. Describe the colour and markings for each breed in this list. (12 marks)

1. Holstein

   Colour:

   Markings

2. Jersey

   Colour:

   Markings

3. Guernsey

   Colour:

   Markings

4. Ayrshire

   Colour:

   Markings

5. Brown Swiss

   Colour:

   Markings

6. Canadienne

   Colour:

   Markings

Assign 4.2: Calf Management

Here are a few quick questions to highlight some of the reasons for the calf management strategies we have just discussed. Answer each of the following questions in complete sentences.

1. List three reasons for separating the calf from its mother soon after birth. (3 marks)

2. Why is it especially important to get the cow to achieve peak milk production as soon as possible following calving (i.e., within four to six weeks)? (2 marks)

3. List three reasons why the calf should consume the mother's first milk (colostrums) within the first 24 hours of life? (3 marks)

4. Give three reasons for housing the calves in plastic domes. (3 marks)

5. How long does it take before a calf born on a farm starts generating a return to the dairy farmer by producing milk? (1 mark)

Assign 4.2: Dairy Farm Management

Answer each of the following questions in complete sentences.

1. An automated milking system that records individual information and can accommodate about 60 cows can cost up to $250 000! And the robot may not reduce the time spent in the barn. The operator could need to spend more time making sure all the cows have visited the milker, especially new or reluctant ones; getting the teat information established in the system; and making sure the robot and software are working properly. Give three reasons why a dairy operator would still wish to use this system. (3 marks)

2. The DHI (Dairy Herd Improvement) program is optional, and there is a significant fee for participation. Give the main reason a farmer would be motivated to participate. (1 mark)

3. Name two production monitoring factors and explain how each factor would be related to profi t and loss on a dairy farm. (4 marks)

4. Explain why you can't go into a local grocery store and buy a litre of 100% Patty's Dairy milk. (1 mark)

Assign 4.2: Designing a Pig Pen

Let's work through designing a pen. You'll probably have to review the Lesson B material to find the information you need.

1. Imagine that you want the pen to be able to house 15 pigs from weaner weight to market weight. What is the total area of the required pen? (1 mark)

2. What is the recommended shape of the pen? (1 mark)

3. What is the recommended width of the pen? (1 mark)

4. What is the minimum length of the pen? (1 mark)

5. Why wouldn't you want a completely slotted floor in your pig pen? (1 mark)

6. Why is it particularly important to regulate temperature and ventilation in your pig housing? What happens if they get hot? (2 marks)

Assign 4.3: Terms

Match the following terms to their correct definition. Note you will have more terms than you will need. (1 mark for each correct match)

1. A closed system where all conditions (temperature, air quality, humidity, lighting) are monitored and maintained at optimum conditions. _____
2. A female swine that shows evidence of having given birth. _____
3. Any disease that is spread from animals to people. Infl uenza type A, Listeriosis, BSE (mad cow disease), and Salmonella are examples. _____
4. To give birth to piglets. _____
5. Nursery pig after weaning pertains to those up to 50 pounds (or 25 kg) body weight. _____
6. Supplemental feed for young, preweaned piglets in addition to the sow's milk. Creep feed is very palatable, highly digestible, and high in protein. A creep feeder stores the feed for free access by the piglets, but not the sow. _____
7. An uncastrated (intact) male pig. _____

a. barrow

b. biosecurity

c. boar

d. controlled environment

e. creep feed

f. farrow

g. flushing

h. sow

i. weaner

j. zoonotic disease

Assign 4.3: Plan an Interview

Write 10 questions that you would want to ask if you were going to write a profile of a market hog producer. You are interested in the different choices this producer has made for:

- housing
- feeding
- breeding
- handling
- sending the hogs to market

You are interested in the full scope of the operation: from size to manure.

Be specific as possible: These must be specific questions concerning management methods for swine, not general background questions. For example, “How is manure collected from the feeder barn?” would be a better question than “How do you handle manure?”

Evaluation Guidelines

Includes 10 distinct questions (10 marks)

5 marks for forming questions specifically about management of swine (1 mark will be deducted for each question that is too general)

1 mark for including a question about each of the 5 distinct areas mentioned (5 marks)

Total Marks
20

Assign 4.3: The Pork Management Web

Create a visual presentation that represents how one management choice affects another with regards to pork production.

Keep in mind all 6 issues of livestock management:

- production monitoring
- planned breeding
- appropriate housing
- environmental sustainability
- correct feed
- regular health care

Then, in two paragraphs, explain how two different choices affect other management issues. Use specific examples.

For example, how does the choice of manure management when building the pigs' enclosure have an effect on the health of the pigs? The quality of the meat? The environmental sustainability? Each decision you choose to explore as an example may not be present in all six issues, but they should affect 2–3 others.

Medium
Choose a method to display the relationship between the different aspects of livestock management. This may include a:

- graph
- chart
- flow chart
- diagram

You may choose to do this by hand on paper, or on the computer using slide show presentation software, or a graphics program. See the visual design scoring guide for tips on how to create a presentation that will earn full marks.

Note: You will want to read through the breeding and feeding of pigs in the **Module 4 Source File**.

Evaluation Guidelines

Your visual presentation will be evaluated based on the visual presentation guide x 2.

Total Marks
12

Assign 4.4: The Laying Flock

Answer the questions in the space provided.

1. What is one reliable method for determining if a laying hen is out of production? (1 mark)

2. Describe the measure taken by intensive egg producers to ensure good production. Is this something Lickenlake Farm does as well? (2 marks)

3. What health benefits do you think come from using the type of management system used at Lickenlake Farm—both their housing and their system of managing the flock? Would they encounter fewer negative behaviours than other intensive farms? Why or why not? (3 marks)

Assign 4.4: Report on Your Eggs-periments

Collect together your observations from *Lesson C Activity 1: The Raw and the Cooked*, and *Lesson D Activity 1: Eggs-periment #3: The Breakout Method*. The following questions will help you create a summary of your findings. Answer the questions and submit the diagrams as requested.

Notes:

- Don't worry if you had trouble with some of the activities, or didn't get the results you expected. Your instructor is most interested in receiving a clear report of what did happen.

- Make neat diagrams. You may use a separate piece of paper, if you want, but make sure you label it clearly so that your instructor knows which question the diagram is for.

Eggs-periment #1

1. Draw what you saw when you cracked open an egg. Label the yolk, thin albumen, and thick albumen.

2. Describe the colour of the yolk. What does this tell you about how the chicken was fed?

3. Were you able to find the blastodisc? How about the chalazae? Explain. (If you were able to find these parts, they should be marked and labelled on your diagram.)

4. How thick was the shell? Was it easy to get this measurement? Explain.

Eggs-periment #2

1. Submit the two sketches: one of the whole egg, one of the egg cut in half lengthwise.

2. What does the position of the yolk tell you about the egg?

Eggs-periment #3

1. Submit a side view and top view diagram of the three eggs. Be sure to label the diagrams so that the age of the egg in each diagram is clear.

2. What difference would you expect between the three-week-old egg and the fresh egg? Why?

3. Did your result confi rm this hypothesis? Explain.

Evaluation Guidelines

Eggs-periment #1 (15 marks)

- Inside of an egg is clearly sketched (2 marks)
- Sketch is clearly labelled (3 marks)
- Colour is described clearly (1 mark)
- Explanation demonstrates understanding of effect of feed on yolk colour (2 marks)
- Demonstrates knowledge of nature and location of blastodisc (2 marks)
- Locates chalazae (1 mark)
- Records reasonable measurement (2 marks)
- Clearly describes experiences in measuring shell (2 marks)

Eggs-periment #2 (8 marks)

- Clearly illustrates diagrams of eggs (2 marks)
- Clearly labels diagrams of eggs (3 marks)
- Demonstrates understanding of the relationship between the position of the yolk and the freshness of the egg (3 marks)

Eggs-periment #3 (9 marks)

- Drawing clearly shows side and top view of eggs (2 marks)
- Drawing of side and top views are clearly labelled (2 marks)
- Explanation of fresher egg difference from older egg is clear and complete (3 marks)
- Hypothesis is clearly stated to be confirmed or rejected, and the reason given (2 marks)

Total Marks
32

Lesson C Activity 1: The Raw and the Cooked

This activity helps you collect the information you need to complete your next activity, and ultimately your section assignment. Read Part 2 of your Section 4 Assignment now so that you know what's going on.

Make sure you have the diagram *Inside an Egg* from this lesson handy.

You'll also need:

- 2 fresh eggs (purchased within the last week and kept in the fridge)
- a white or light-coloured small plate with a lip
- another plate or small bowl
- blunt table knife
- a darning needle or similar sharp, clean object
- ruler
- pot and water suitable for making a boiled egg
- the magnifying glass from your Hands-On kit
- paper and pencil for drawing

Notes:

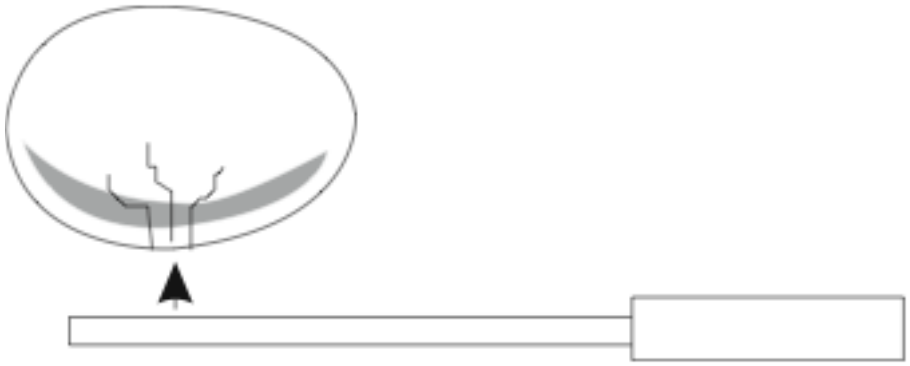
- Read through both eggs-periments from beginning to end before you start work.
- Section 4 Assignment Part 2 asks you to submit your diagrams. Make a rough sketch in the space provided in this activity; then do a neater version in the space provided in the section assignment.

Eggs-periment #1: The Raw Egg
Careful—you won't be able to examine the yolk properly if you don't follow the instructions for opening the egg.

Cracking the Egg Open

1. Put a plate on a fl at, well-lit surface.

2. Hold one egg sideways over the small plate.



How to Hold the Egg
Crack it with on sharp blow to the bottom of the egg.

3. Crack the bottom of the egg with the knife.

4. Open the egg carefully, letting the contents drop out onto the plate.

5. Put the shell in the other plate or small bowl.

Observations of the Yolk and Albumen

1. Draw what you see and label each part of the egg. You don't need to draw to scale, but be careful to keep proportions roughly correct.

2. How would you describe the shade of yellow of the yolk?

3. Can you locate the blastodisc with your naked eye?

4. Can you locate the blastodisc with your magnifying glass?

5. Add the blastodisc to your diagram if you have not already done so.

6. Can you easily see the difference between the thin and the thick albumen?

7. Can you see the chalazae? Are they a different colour than the rest of the albumen?

8. Look for dark or bloody spots in the egg. If you find any, mark them on your diagram.

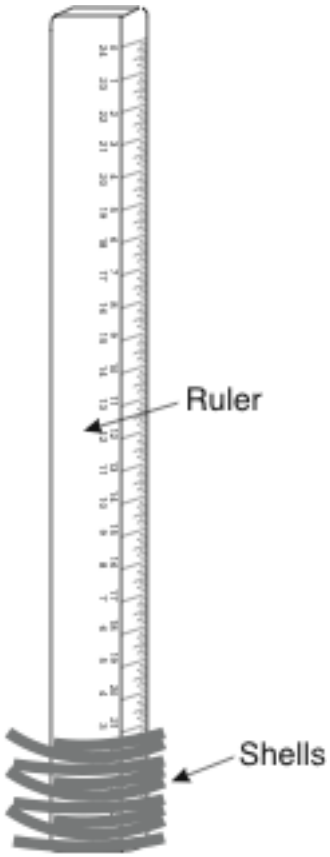
Observing the Shell

1. Describe what you find attached to the inside of the shell.

2. Measure the thickness of the shell. Unless you have a very finely graded measuring device, this is difficult. Here's how you can do it with a regular ruler.

    - Prop your ruler against something until it is upright.
    - Break the shell into pieces until you have a stack 5 mm high. Flatten each piece as best you can.
    - Divide 5 by the number of pieces in the shell. This tells you how thick each piece is, which is the thickness of the shell.

    For example: let's say it takes 11 pieces of egg shell to reach 5 mm. 5 ÷ 11 = 0.45. The shell is 0.45 mm thick.



Note: Forget about your dog eating your homework—if you have kept your work area clean, you can cook and eat your own! Not hungry right away? Keep it sealed in the fridge for up to one day.

Eggs-periment #2: The Cooked Egg

Make a Hard-Boiled Egg

1. Put a whole egg in enough cold water to cover it.
2. Bring the water to a boil for 1 minute.
3. Remove from heat and leave in hot water for 3 more minutes.
4. Take the egg out of the water and wait for it to cool.

Observations

1. Peel the egg and draw the shape.
2. What evidence do you see of the air sack? Label the location on your diagram.
3. Slice the egg lengthwise.

4. Do another diagram that shows where the yolk is positioned in the egg.

Note: If you have kept your work area clean, this egg is good to eat!

Keep your observations to complete Part 2 of your section assignment.

Lesson D Activity 1: Eggs-periment #3: The Breakout Method

This activity helps you collect the information you need to complete Section 4 Assignment Part 2.

Very important! Before you start this eggs-periment, use a pen to label each egg. Label the freshest egg No.1, the two-week-old egg No. 2, and the three-week-old egg No.3. You can write right on the shell.

Make sure you have the diagram *Inside an Egg* from Lesson C handy.

You'll also need:

- 3 white-shelled eggs—1 fresh, 1 two weeks old, 1 three weeks old
- three plates with lips

Notes:

- Read through the instructions in this activity from beginning to end before you start work.
- Part 2 of your section assignment asks you to submit your diagrams. Make a rough sketch in the space provided in this activity; then do a neater version in the space provided in the section assignment.

Instructions
Say good-bye to your whole eggs! Egg testers usually break open a few eggs from each large batch just to confirm the general standards suggested by the candling. Here's how to do that.

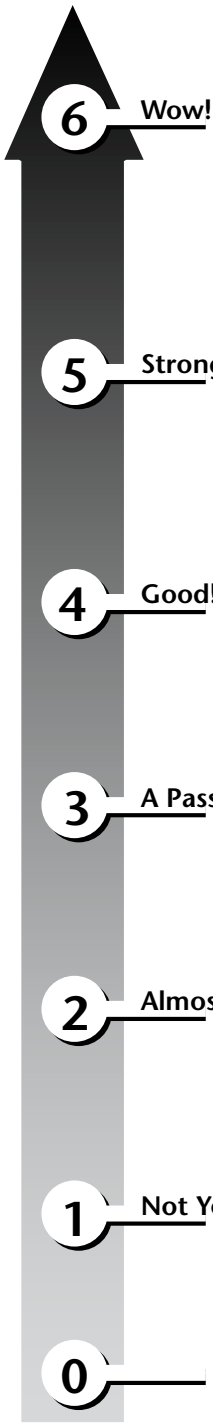
1. Put your three plates on an even surface.

2. Break one egg into each plate, being careful to note which egg goes into which plate.

3. Draw the top and side view of each egg. You might fi nd it helpful to review the diagram of open eggs in this lesson.

Keep your observations to complete Part 2 of your section assignment.

Visual Design Scoring Guide



6 Wow!

Your **superior** product is thoughtful, creative, and well designed:

- ❑ Product has a clear purpose and sense of audience
- ❑ Includes significant and relevant details
- ❑ Layout is balanced and logically organized
- ❑ Effective use of titles and headlines; important elements are clearly emphasized
- ❑ Strong visuals add to the product
- ❑ May contain some minor errors

5 Strong!

Your **effective** product is clear, organized, and well designed:

- ❑ Product has a sense of purpose and audience
- ❑ Includes most significant details
- ❑ Layout is balanced and logically organized
- ❑ Appropriate titles and headlines with some elements emphasized
- ❑ Effective visuals add to the product
- ❑ May contain a **handful of minor errors or gaps**

4 Good!

Your **competent** product is acceptable:

- ❑ Product has some sense of audience and purpose
- ❑ Some details may be missing or repeated
- ❑ Organization is present but may lack balance
- ❑ Acceptable titles and headings with some elements emphasized
- ❑ A **number of errors;** some gaps present

3 A Pass!

Your **adequate** product is minimally acceptable:

- ❑ Weak sense of audience and purpose
- ❑ May contain irrelevant details or some details may be missing
- ❑ Lack of organization and balance
- ❑ Titles, headings, and visuals may be weak or missing
- ❑ **Numerous errors;** gaps are present

2 Almost

Your **inadequate** product is incomplete and unclear:

- ❑ Product doesn't address audience or purpose
- ❑ Details are irrelevant or missing
- ❑ Some visual support but lacks balance
- ❑ Titles and headings are weak or missing; visuals less than acceptable
- ❑ **Numerous errors** interfere with meaning

1 Not Yet

Your product is **unacceptable:**

- ❑ An attempt was made
- ❑ The product does not demonstrate an understanding of the purpose
- ❑ Significant information is missing; layout is inappropriate

0

The product is off topic or difficult to understand