



The Farm-Food Connection

KIDS AND ANIMALS

INTERMEDIATE LEVEL CLASSROOM ACTIVITIES ABOUT EGG PRODUCTION

BCSPCA

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The Farm Food Connection

Big Idea:

With the world and Canada's growing population, development, and therefore use of resources, it is important for students to know where their food is coming from and the impact it has. As demand for cheap animal protein increases globally, the impacts of that demand can be seen in our environment, climate, quality of food and the sacrifices in welfare for the animals.

The Farm Food Connection introduces the animal welfare aspect in food production. Students will make connections between their life and farms, be introduced to the varying living conditions that farm animals have, and to consider the needs that must be met within those living conditions. Students will be asked to take what they have learned and discuss where it fits into their individual value system. From there, they can choose to educate their communities or families on what they have learned so that more people can make educated decisions when it comes to our food.

The 30-minute **Cluck!** video is designed to be integrated with the lessons. Cluck! brings the farm to your classroom. The lessons can be completed after viewing each video chapter or can be done after viewing the complete video.

One of the world's foremost authorities on poultry, Dr. Ian Duncan, takes you inside a modern egg laying facility in Richmond, B.C., to explain what life is like for egg-laying hens. Dr. Duncan discusses the anatomy of chickens, natural hen behaviours and how various management systems provide for chickens' behavioural needs. Students are challenged to examine how farms are designed to meet the needs of chickens, control for issues such as food safety, environmental issues and transportation costs, and how their design impacts the cost of eggs.

Presentations:

In many of our locations, we offer a classroom presentation to complement these lessons. To request a presentation, contact your local BC SPCA branch or email us at pneuman@spca.bc.ca.



Core Competencies

Communication

Children are inherently interested in animals. In our programs, that natural curiosity fuels their engagement and inspires them to connect with others on topics that are relatable such as pets, wildlife and farm animals. Children practise acquiring new information about the animal world and sharing that information both formally and informally in groups or pairs, in presentations, or with the public as advocates. Through our interactive activities students collaborate with classmates to solve problems and create projects, and reflect on their own experiences and how their knowledge has evolved over time.

Thinking

Through our lessons and presentations students have the opportunity to practise creative thinking, generating and developing new ideas about real issues that affect their lives every day. They are challenged to create new ways to change and improve the world around them as they learn more about animal well-being. By exploring their own basic needs and comparing them to the needs of animals, students think critically about how their personal decisions also affect other lives, their community, and the environment. Older students can also begin to consider their own experiences, their culture and the media, and contemplate where their knowledge and opinions come from.

Personal & Social

All of our programs have a basis in empathy building, compassion, and teaching young people to understand and care about themselves and others. Students learn to read the unspoken signals and emotions of animals and practise recognizing and regulating their own actions and emotions in accordance with their surroundings. They will begin to situate themselves in a broader environment that encompasses animals, other people, community and nature. Through games, activities and discussion they learn tangible strategies to peacefully solve problems and develop a sense of accountability that extends beyond the personal to the social.

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The Farm-Food Connection

Understanding where our food comes from and the conditions in which animals are typically raised for food will allow students to think critically and make choices that are in sync with their values.

Big Ideas Career Education: Public identity is influenced by personal choices and decisions.
New experiences, both within and outside of school, expand our career skill set and options.

Science: All living things sense and respond to their environment.

English Language Arts: Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens.

Curricular Competencies

Career Education

- ▶ Recognize the need for others who can support their learning and personal growth
- ▶ Demonstrate respect for differences in the classroom
- ▶ Use innovative thinking when solving problems
- ▶ Appreciate the influence of peer relationships, family, and community on personal choices and goal
- ▶ Appreciate the importance of respect, inclusivity, and other positive behaviours in diverse, collaborative learning, and work environments
- ▶ Question self and others about the reciprocal relationship between self and community
- ▶ Demonstrate leadership skills through collaborative activities in the school and community

English Language Arts

- ▶ sensing and responding: other animals
- ▶ Survival needs
- ▶ Access and integrate information and ideas from a variety of sources and from prior knowledge to build understanding
- ▶ Use a variety of comprehension strategies before, during, and after reading, listening, or viewing to deepen understanding of text
- ▶ Identify how differences in context, perspectives, and voice influence meaning in texts
- ▶ Use personal experience and knowledge to connect to text and deepen understanding of self, community, and world
- ▶ Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability
- ▶ Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking
- ▶ Construct meaningful personal connections between self, text, and world

Pre-Video Lesson Plans

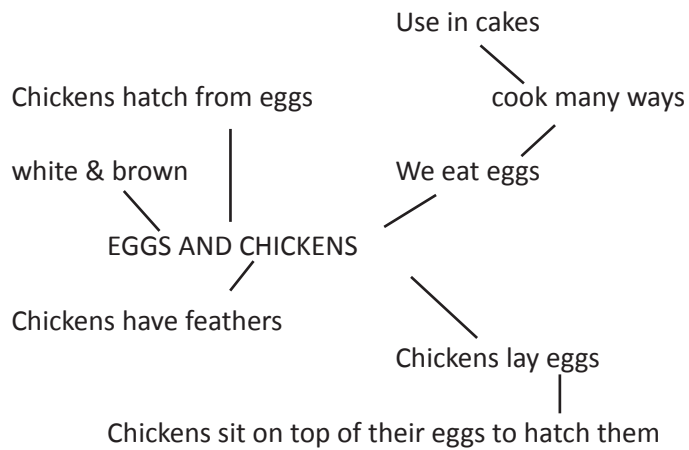
Teacher

Activity: Mind Map: What do you know?

Brainstorm what the students know about eggs, chickens and hatching. List these ideas on chart paper.

Divide the students into groups and have them web their knowledge radiating around the words eggs and chickens. Have each group discuss their web in front of the class. Post the webs around the room.

EXAMPLE:



Teacher

Pre-test: Your Chicken IQ

This activity is a pre-test to the unit on egg-laying chickens. The students should be given this before any information is presented. The next step is to provide them with the information along with similar questions that can either be answered on paper by the student or used as discussion questions. The pre-test gives students some idea about the things they will learn in this unit. It is a good way to keep their attention throughout the unit so that they can see if they answered correctly. Do not hand the tests back until the end of the unit.

Activity: Test Your Chicken IQ

Tell the students you are going to give them a test to see how much they already know about the unit you are about to teach on eggs and chickens. This will not be graded but it is important they try their best.

Your Chicken IQ

Select the best answer

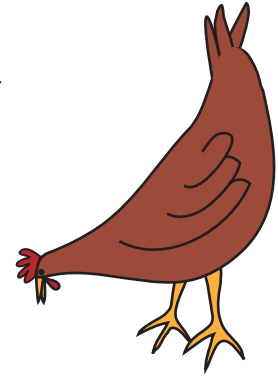
1. How long does it take a hen to produce an egg?
 - a. 10 hours
 - b. 24 hours
 - c. 2 days
 - d. 3 days
2. A hen starts laying eggs at what age?
 - a. 18 weeks
 - b. 24 weeks
 - c. 5 months
 - d. 10 months
3. How long does a chicken live that is raised for meat (i.e. chicken wings, breasts, drumsticks)?
 - a. 6 weeks
 - b. 8 weeks
 - c. 6 months
 - d. 12 months
4. How long does a chicken live that is raised to lay eggs?
 - a. 6 months
 - b. 1 year
 - c. 18 months
 - d. 3 years
5. What happens to male chickens born for egg laying production?
 - a. they are used for meat chickens
 - b. they go to pasture
 - c. they are disposed of
 - d. they become pets
6. Why are most of the eggs we eat unfertilized (not able to produce a chick)?
 - a. because they are gathered before they are fertilized
 - b. because there are no roosters in with the hens
 - c. because roosters can't fertilize eggs of laying hens
 - d. because white eggs can not be fertilized

7. A chicken's body is covered with _____ & _____.

- a. feathers and hair
- b. fur and scales
- c. feathers and needles

8. Roosters have larger _____ than hens.

- a. beaks
- b. ears
- c. eyes
- d. combs



9. Why can't a chicken see anything directly in front of it?

- a. beak is too big
- b. comb is in the way
- c. eyes are on the side
- d. they are cross-eyed

10. Chicken bones are filled with _____.

- a. air
- b. water
- c. jelly
- d. oil

11. Chickens have a beak but no _____.

- a. tongue
- b. teeth
- c. ears
- d. feet

12. A chicken's feathers are effective for _____ & _____.

- a. warmth and waterproofing
- b. protection and pecking
- c. disease control and sunburn

13. Chickens coat their feathers with _____ to aid in waterproofing.

- a. dirt
- b. water
- c. oil
- d. sand

14. Ranking in a flock of chickens is determined by

_____.

- a. age
- b. size
- c. peck order
- d. colour of feathers

15. How are most egg-laying hens housed?

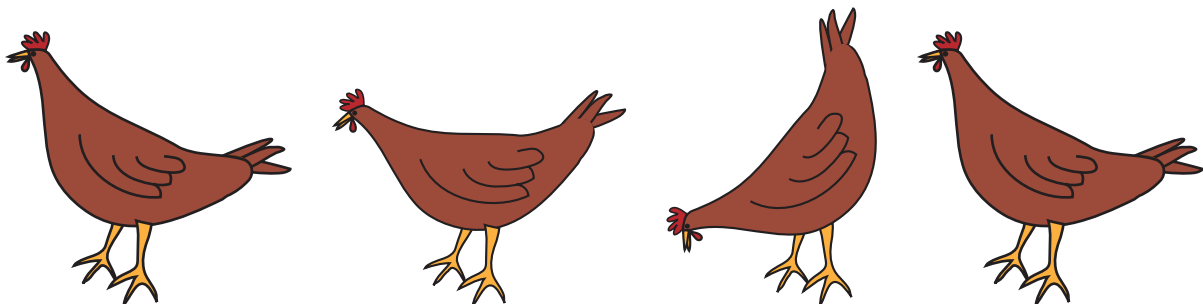
- a. caged
- b. indoors but not in cages
- c. indoors with access to the outdoors
- d. outdoors only

16. Why are egg-laying hens kept in battery cages?

- a. to keep each other company
- b. to stay warm
- c. cheaper to house
- d. they prefer to live in cages

17. A hen in a battery cage has about as much floor space as

- a. this piece of paper
- b. a school desk
- c. a kitchen table
- d. a school yard



Teacher

Introduction: Background Information

Before entering the barn, Dr. Ian Duncan puts booties on as part of biosecurity measure to prevent the spread of disease to the birds. One of the main contaminants that is of concern is Salmonella. Barns are regularly tested to ensure that the birds, their feed and their environment are not infected. Salmonella contamination is very rare in Canada due to such strict biosecurity procedures.

The barn in which Dr. Duncan is filmed is Rabbit River Farms, in Richmond, B.C. It is an SPCA Certified organic farm. This farm is quite unique in its set-up of various levels and the automated systems that are in place for food, water, egg collection and manure collection.

There are several different ways to house chickens to be in a free range or free run system. Most SPCA Certified barns are one level with nesting boxes and perch areas for the birds but are not as mechanized as Rabbit River Farms. All farms and the eggs produced must meet the Canadian food safety regulations before they are ready for human consumption.

Approximately 88% of eggs in B.C. are produced by hens housed in a conventional cage system called battery cages. The rest of the hens are housed in cage-free systems; free run or free range, some of these farms are certified to BC SPCA or organic standards. Outside of B.C. the percentage is as high as 95%. This means that consumer demand for specialty eggs, free range, free run and organic, is higher in B.C. than the rest of the country and is slowly increasing every year.

Eggs are generally collected twice a day and stored in a room at a temperature of 11-12°C. Rabbit River Farms is also quite unique in that it is licensed to grade and market its own eggs as well as other speciality eggs from nearby farms. Cage-free eggs are sent to Rabbit River Farms by a refrigerated truck within 4 days of being laid, graded, packaged according to egg size, refrigerated and then transported by refrigerated truck to the grocery store.

Teacher

Discussion Questions

1. Why are farms under biosecurity restrictions? *In order to keep the birds healthy it is important that disease isn't brought in from outside the farm. This became even more apparent during the Avian flu outbreak of 2004.*
2. What types of disease or bacteria are chickens susceptible to? *The main concern is salmonella, but birds may also get bursal, new castle disease, fowl pox, bronchitis and mareks. Most birds are vaccinated when they are pullets (a female chicken under 1 year old).*
3. What is the difference between a free run system and a conventional cage system? *In a free run system the birds are free to move about inside the barn, and are provided with nest boxes. If the free run farm is SPCA Certified it will also have perches and a space for hens to forage, dustbathe and scratch. In a conventional cage system the birds have very little space to move about and do not have places to perch, nest, forage, scratch, stretch their wings or dustbathe.*
4. Why are most eggs produced by hens in caged systems? *The majority of consumers purchase conventional eggs which come from caged hens because they are the cheapest eggs. If the demand changes so will the way the hens are housed.*
5. Why do you think B.C. has a higher number of hens raised in free range, free run or organic production systems than the rest of Canada? *Answers will vary*
6. Do all egg farmers grade their own eggs? *Most farmers send their eggs to be graded at a grading station. There are only 5 grading stations in B.C.*
7. If you buy eggs directly from the farmer are the eggs graded? *Not usually unless they have a grading station on their farm.*

Teacher

Anatomy: Background Information

Chickens' eyes are on the sides of their heads. They can see more around them but nothing directly in front of them. Chickens bob their heads back and forth so they can get a three-dimensional view of objects.

The **comb** is the fleshy part on top of the head that is usually red and **wattles** are fleshy, red dangling parts under the chin. Each comb is unique and scientists believe that chickens recognize each other by their comb.

Chickens have beaks but do not have teeth. Food gets ground in their three stomachs. The **crop** stores the grain after it is swallowed. It then moves through the **glandular stomach** which produces acid and enzymes to break down the grain. The **gizzard** grinds the grain up even smaller to aid in the digestion process.

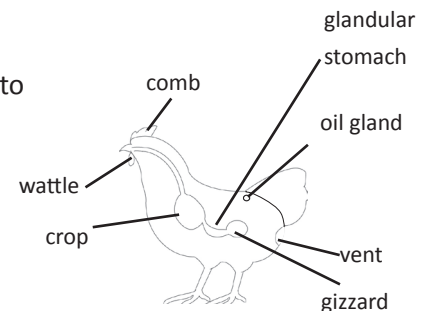
Chickens use their beaks to preen or straighten out their feathers and spread oil over them to waterproof their feathers. They use their beaks to squeeze out oil from an **oil gland** at the base of their tail and spread the oil over their feathers with their beaks.

Chickens' feet are designed to grip things so they can rest on a perch. They have four toes; three that point forward to grip around the front of a perch and one that points to the back that gives them balance on the perch by gripping the back of the perch. The chicken's ancestor, the Jungle Fowl escaped and hid from predators by flying up to a branch to rest and roost at night.

Chickens have only one opening from which they drop their waste and produce an egg. This is called the **vent** or cloaca and is located below their tail feathers.

Activity: Chicken Anatomy

Students will use the words next to the diagram of a chicken on page 10 to fill in the blanks and then label the diagram.



Discussion Questions

Why are chickens' combs unique? *Animal welfare scientists believe that chickens recognize each other by the shape of their comb.*

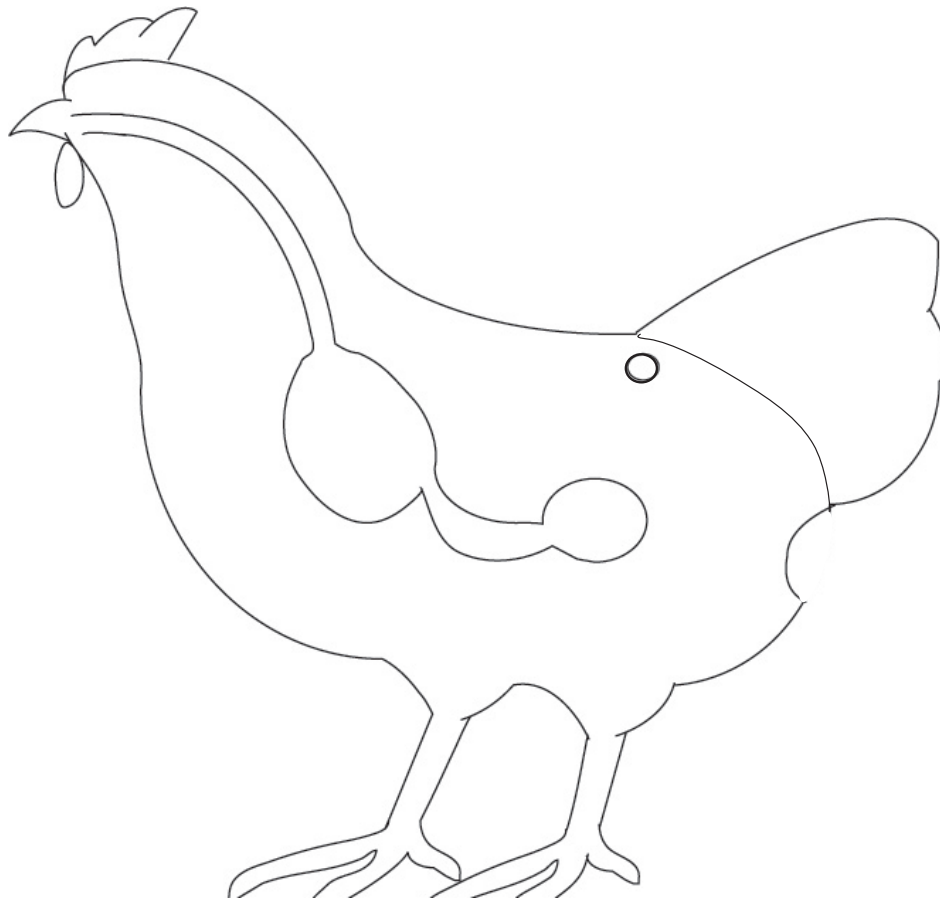
Why do chickens bob their head back and forth? *So they can get a three-dimensional view of objects.*

Why don't chickens have teeth? *Chickens have three stomachs that are part of the digestion process. The gizzard grinds up food into smaller bits that would normally be done by teeth in other animals.*

How do hens stay clean? *Hens "comb" their feathers with their beaks, dustbathe to remove stale oil and then use their beaks to spread fresh oil from an oil gland onto their feathers in order to waterproof the feathers and repel parasites.*

Why do chickens have four toes? *Chickens have four toes so that they are able to perch and hang on to branches. This is especially important for roosting and escaping predators or dominant birds.*

Chicken Anatomy



glandular stomach
wattle
oil gland
gizzard
comb
vent
crop

Choose a word from the list beside the chicken diagram to fill in the blanks below. Then use those words to label the diagram.

Chickens' eyes are on the side of their head. This way they can see more around them but nothing directly in front of them. Chickens bob their heads back and forth so they can get a three dimensional view of objects.

The _____ is the fleshy part on top of the head that is usually red and a _____ is the fleshy, red dangling parts under the chin. These parts are unique to each bird and scientists believe that chickens recognize each other by these features.

Chickens have a beak but they do not have teeth to grind up food. Instead they have three parts to their stomach. The _____ stores the grain after it is swallowed. From there it moves through the _____ which produces acid to break down the grain. Then it moves into the _____ where the particles are ground up even smaller to aid in the digestion process.

Chickens also use their beaks to preen or straighten out their feathers as well as spread oil over them to waterproof their feathers. They use their beak to squeeze out oil from an _____ at the base of their tail and then spread the oil over their feathers.

Chickens have only one opening from which they drop their waste and produce an egg. This is called the _____ or cloaca and is located below their tail feathers.

Teacher

Behaviour: Background Information

PERCHING: Chickens have feet designed to hang on to things. They fly up to perches in order to escape a more dominant hen or to rest and roost. Chickens have different postures when they roost and perch. When perching to rest or to look at things from a different vantage point their posture is upright and their legs are straight. When they roost to sleep, their posture is crouched and their feet can't be seen. Chickens are motivated to perch to feel safe from predators.

Battery cages do not have perches. Chickens kept on a wire floor or wire cage bottom can form callouses on their feet, and because there is nowhere to scratch they are unable to wear down their claws. They also have nowhere to rest comfortably.

PECK ORDER: Chickens have a social order called a peck order. Dominant birds may be challenged by a lower ranking bird especially when a flock is young and the peck order is being established. In a large barn there are several birds with dominant status, a few more with middle status and the rest with the lowest status. Once the order is established a subordinate bird will not challenge a dominant bird at the feeding station or may move to another area where there is space on the feed line. Subordinate birds may be "pecked on" to reconfirm their low status by other more dominant birds. For a subordinate bird to be able to escape by flying up to perch or moving to a different location in the barn it is important for survival so the subordinate bird isn't injured or killed by dominant birds.

DUST BATHING: By flicking dust into their feathers, chickens clean out the stale oil that they had just days before spread on their feathers with to make them waterproof. The dust sticks to the oil and is then shaken out before the process of adding fresh oil by preening begins. This behaviour is done regularly, about once every couple of days, and is often done in a group.

FORAGING: Chickens are naturally curious beings. Foraging and scratching the ground is how hens spend 50-70% of their day in natural living conditions. They do this to look for food or for small stones to ingest to help with the grinding of their food in the gizzard. Even when they are provided with ample food chickens still have a natural urge to explore and forage.

NESTING: Chickens start to make noise and get a bit agitated when they are ready to lay their egg. They search for a private place to lay their egg.

SPREADING WINGS: When chickens spread and flap their wings it is good exercise and improves muscle tone. When they flap their wings, they also raise their heads which is a way the birds identify threats and communicate with other birds. Hens in cages can't do this.

Teacher

Activity: Chicken Behaviour

Students will match the word with the correct definition. Then they will rank the behaviours listed in the table by level of importance to hen welfare.

Behaviour	welfare rating (0-5)
dustbathing	4
foraging	5
scratching	5
perching	4
nesting	5
spread wings	5
peck order	5
eating	5
drinking	5
sunlight exposure	4

Discussion Questions

If the basic needs of food, water and health are provided for hens, do they need to have the opportunity to perform other behaviours? *For good animal welfare it is important to provide hens with the ability to perform natural behaviours. If they don't have the opportunity to express these behaviours they become stressed, frustrated and bored.*

Are places for chickens to perch necessary for chickens to have a safe and healthy environment? *Perches provide an escape from a dominant bird, provide exercise for the bird and a feeling of security. It is also where they sleep.*

Is dustbathing necessary for chicken health and welfare? *Hens in a barn situation still have the biological urge to clean and waterproof their feathers. It is not a necessary component for health but reduces frustration and promotes good welfare. Dustbathing is also a social activity; hens enjoy dustbathing together in groups.*

If chickens would normally forage for most of their day, what do they do instead when they don't have a place to forage? *They will be bored and frustrated and may turn to other behaviours such as pecking other hens as relief.*

Chicken Behaviour

Match the definition on the right to the word on the left. Put the number of the matching word in the box next to the correct definition.

1. dustbathe Chickens have feet designed to hang on to things. They do this in order to escape a more dominant hen or to rest and roost.
2. forage Chickens establish the rank of birds within a small group. The group consists of dominant, subordinate and middle ranked birds. Status is challenged more so when a flock is young. It is important for subordinate birds to have a place to escape if they are being pecked on by dominant or middle-ranked birds.
3. peck order By flicking dust into their feathers, chickens clean out the stale oil that they had just days before spread on their feathers to make them waterproof. The dust sticks to the oil and is then shaken out before the process of adding fresh oil by preening begins. This behaviour is done regularly, about once every couple of days, and is often done in a group.
4. perch Chickens are naturally curious beings. Hens spend 50-70% of their day in natural living conditions doing this. They do this to look for food or for small stones to ingest to help with the grinding of their food in the gizzard. Even when they are provided with ample food, chickens still have a natural urge to explore and forage.
5. nest When hens are ready to lay their egg they start to get a bit agitated and look for a private place to lay their egg.

Rank the following behaviours on a scale of 0-5 with 5 being the most important for the welfare of egg-laying hens.

Behaviour	welfare rating (0-5)
dustbathing	
foraging	
scratching	
perching	
nesting	
spread wings	
peck order	
eating	
drinking	
sunlight exposure	

Teacher

Nutrition: Background Information

Proper food and water and access to both is important for hen health.

Some barns have an automated system that sends food on a moving belt on several different levels for the birds to eat. Other barns have manual systems in which feeders must be filled regularly by hand.

Automated barns use water lines with nipples where the hens can peck to get a constant supply of clean water. In cages the water line is above the cage and the nipple is made available inside the cage. Some non-automated barns use manual water systems with a refillable storage of water where water levels are maintained in the basin from which the birds drink.

Forming an egg every day requires a hen to use calcium diverted from her bones. The calcium requirement for the high rate of egg production is immense. A calcium supplement is a way to increase the level of calcium a hen requires and helps improve bone strength that can be depleted if calcium is not restored at a rate needed to produce eggs.

The weight of a hen can be an indicator of good or poor health. Some free run/range barns have a scale on which birds randomly perch and their weight is recorded automatically into a computer system. The farmer can then determine if the weight of the hens is normal for their age. If the hens are over or under weight the farmer can adjust their feed.

Manure Management: Separating the hens' droppings from the space where they live is important to prevent disease. In automated barns (in any housing system) the birds' droppings fall through slatted floors and the manure is taken away on a belt. If the barn does not have an automated system the farmer may have an area of slatted floor in which the birds tend to defecate, usually near the drinking and feeding areas. In cases where there are droppings in an all litter or partially littered floor, the litter must be monitored and wet litter removed regularly to prevent the hens from walking in their droppings. It is also important to have good ventilation in the barns to remove water vapor which aids in the drying of litter. Ventilation also removes gases such as ammonia that come from droppings.

Discussion Questions

Why do birds need to be separated from their droppings? *To prevent disease that can be picked up in bird droppings.*

Why is it a good idea to give egg-laying hens a calcium supplement? *Hens require calcium in order to produce the shell of an egg. Calcium is also needed to keep bones strong and healthy. A supplement can increase the amount of calcium in the body to maintain both bone strength and produce egg shells.*

Why do some farms have weigh scales for the birds? *A bird's weight is an indicator of health.*

Teacher

Living Conditions: Background Information

In Canada farmers adhere to Canada's Codes of Practice for the care and handling of farm animals. These practices are agreed upon by consensus between the farmers, veterinarians, scientists, government agencies, SPCAs and humane societies who are members of the National Farm Animal Care Council (NFACC).

The Codes outline minimum requirements and recommend best practices. These serve as a reference document for animal cruelty laws. The BC SPCA has created its own animal welfare standards that go beyond conventional practices because it believes additional requirements are necessary to truly ensure farm animals have good welfare.

Below are the Canadian Codes of Practice space guidelines for typical brown egg-laying hens. Spacing for typical white-egg layer is slightly smaller (435 cm²) due to their lighter body weight.

	cm ² /hen		
	caged	all wire/slat floor	all litter floor
Caged	483 (22 cm x 22 cm)		
Free Run		950 (28 cm x 34 cm)	1900 (50 cm x 38 cm)
Free Range		950 (28 cm x 34 cm)	1900 (50 cm x 38 cm)

There are several different ways to house hens used for egg production.

Battery Cages:

- ▶ majority of egg-laying hens in Canada are kept in battery cages.
- ▶ age capacity ranges from four to eight hens depending on the size of the hens
- ▶ cages are usually stacked four high
- ▶ on a slight angle to ensure droppings don't enter the cage below.
- ▶ cages don't have nest boxes or places to perch, forage or scratch.

Free Run:

- ▶ birds are not in cages.
- ▶ can move around freely in the barn
- ▶ nest boxes are required
- ▶ some may have perches but this is not required
- ▶ floor can be covered in all litter, partially slatted with a litter area or can be entirely slatted

Free Range:

- ▶ same requirements as free run
- ▶ outdoor access for the birds if the weather is appropriate
- ▶ outdoor area must have perimeter fencing to protect the hens against predators

SPCA Certified or Certified Organic eggs include a set of standards additional to the ones above.

SPCA Certified:

- ▶ birds can not be caged
- ▶ barn floor must be only partially slatted (70% maximum slatted floor space for free range systems and 50% maximum of slatted floor space for free run systems) to allow hens to dustbathe, scratch and forage
- ▶ minimum of 15 cm of linear perch space per bird.
- ▶ Perches must be constructed of a non-slip material, be rounded and have no sharp edges.

Teacher

SPCA Certified cont'd

- ▶ hens kept in a free range system must also have shelter from overhead predators.
- ▶ farms are inspected annually by a third party inspector. Farms must re-certify every year and there are random inspections to ensure compliance with the standards.
- ▶ perches are required

Organic:

- ▶ are kept in a free range system
- ▶ standards are similar to SPCA Certified with the following exceptions:
- ▶ Feed must be organic
- ▶ space requirement per bird is 1666cm² of indoor space and 2500cm² of outdoor space
- ▶ perches are required

cm²/hen

	all litter	partially slatted
SPCA Certified	1900 (50 cm x 38 cm)	1111 (33 cm x 33.75 cm)
Organic	1666 (45 cm x 37 cm) + 2500 (50 cm x 50 cm) outdoor space	1666 (45 cm x 37 cm) + 2500 (50 cm x 50 cm) outdoor space

Discussion Questions

Why would hens require less space if the floor area is fully all wire/slats? *The waste falls through the slats and therefore the chickens don't walk through their waste.*

Why would the BC SPCA not allow the floor to be fully slatted? *A fully slatted floor does not give a place where hens can forage, dustbathe and scratch.*

Why would organic hens have less indoor space? *All organic farms must be free range and therefore the hens get space both indoors and outdoors, weather permitting.*

Which system would require the least amount of labour? *A caged/conventional system because everything is automated.*

Which system would you be able to house the most hens? *A caged/conventional system.*

Which systems are best for hens to express natural behaviours? *SPCA Certified and organic because they allow space to forage, scratch and dustbathe and also require perches. Free range and free run systems that aren't certified don't require these.*

Do free run and free range systems require perching areas? *Under the Canadian Codes of Practice perches are not required for any system, therefore many barns may not provide perching areas.*

If the barn is set up as an aviary or perchery it provides one or several levels of perches and/or slatted/wire floors. Since it is then making use of the cubic space in the barn, the recommended floor space requirements under the Code of Practice is not applied.

Teacher

Activity: Does size matter?

STEP ONE: Using the space requirement table on the next page, separate the class into groups of two or more. Have each group calculate the length and width of a space equivalent for one bird in each system Use tape or string to mark the space on the floor.

STEP TWO: Students will create a chicken using a plastic bag and newspaper to represent a typical brown egg-layer. They are approximately 46 cm tall, 18 cm wide and from beak to tail 41 cm long.

STEP THREE: Students will use the chart on page 24 to assess what behaviours a hen can perform in each living system.

Behaviour	Caged	Free Run		Free Range		SPCA Certified Free Run		SPCA Certified Free Range		Organic (inside can be partially slatted)
		all wire	litter	all wire	litter	partial slats	litter	partial slats	litter	
dustbathing			X		X	X	X	X	X	X
foraging			X		X	X	X	X	X	X
scratching			X		X	X	X	X	X	X
perching		X	X	X	X	X	X	X	X	X
nesting		X	X	X	X	X	X	X	X	X
spread wings		X	X	X	X	X	X	X	X	X
peck order		X	X	X	X	X	X	X	X	X
eating	X	X	X	X	X	X	X	X	X	X
drinking	X	X	X	X	X	X	X	X	X	X
sunlight exposure				X	X			X	X	X

Does Size Matter?

Egg-Laying Hen Housing Space Requirements:

STEP ONE: Using the table below, cut string or tape to demonstrate the space for one bird in each housing system.

		all wire/slats	all litter	partial slats
Caged*	483 (22 cm x 22 cm)			
Free Run*		950 (28 cm x 34 cm)	1900 (50 cm x 38 cm)	
Free Range*		950 (28 cm x 34 cm)	1900 (50 cm x 38 cm)	
SPCA Certified (free range or free run)			1900 (50 cm x 38 cm)	1111 (33 cm x 33.75 cm)
Organic (always free range)			1666 (45 cm x 37 cm) + 2500 (50 cm x 50 cm) outdoor space	1666 (45 cm x 37 cm) + 2500 (50 cm x 50 cm) outdoor space

*guidelines approved by the Canadian Codes of Practice for Poultry-Layers

STEP TWO: Create a chicken by stuffing a plastic bag with newspaper, to equal the size of one brown egg-layer, 46 cm tall, 18 cm wide and 41 cm from beak to tail. Place one “chicken” on each measured out space. This will represent the space for one hen.

STEP THREE: Using the chart below, heck the box if the hen is able to express that behaviour with each housing system.

Behaviour	Caged	Free Run		Free Range		SPCA Certified Free Run		SPCA Certified Free Range		Organic (inside can be partially slatted)
		all wire	litter	all wire	litter	partial slats	litter	partial slats	litter	
dustbathing										
foraging										
scratching										
perching										
nesting										
spread wings										
peck order										
eating										
drinking										
sunlight exposure										

Teacher

Egg Development: Background Information

It takes approximately 24 to 26 hours for a hen to produce an egg. It all begins when the ovary produces the yolk with a germ cell attached. The yolk grows as it is attached to the ovary and when it gets to the right size the follicle that it is in breaks open and releases the yolk into the oviduct. The yolk passes down the oviduct and collects the different layers of albumen (egg white). The albumen is made up of both a jelly-like substance as well as a more liquid-type substance. The yolk and white move into the shell gland where the soft membranes form around the yolk and white. Then the shell gets added on top.

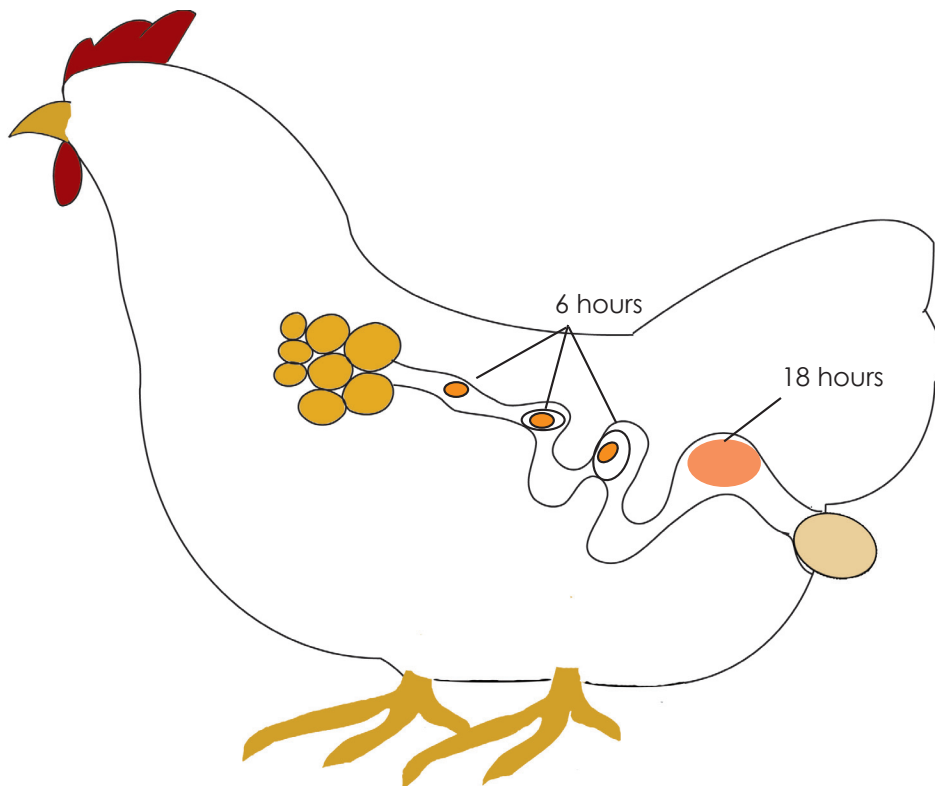
It takes approximately six hours for the white to form and 18 hours for the shell to be made. When the egg is ready to be laid, the hen starts showing nesting behaviour one to one-and-a-half hours before she lays the egg.

The hen lays an egg almost every day so her muscles are quite flexible, therefore laying an egg is likely not painful but rather more uncomfortable.

Thickened strands of egg white protein fasten to the top and bottom of each yolk keeping it centred in the middle of the egg. These are called chalaza.

Activity: Egg Development

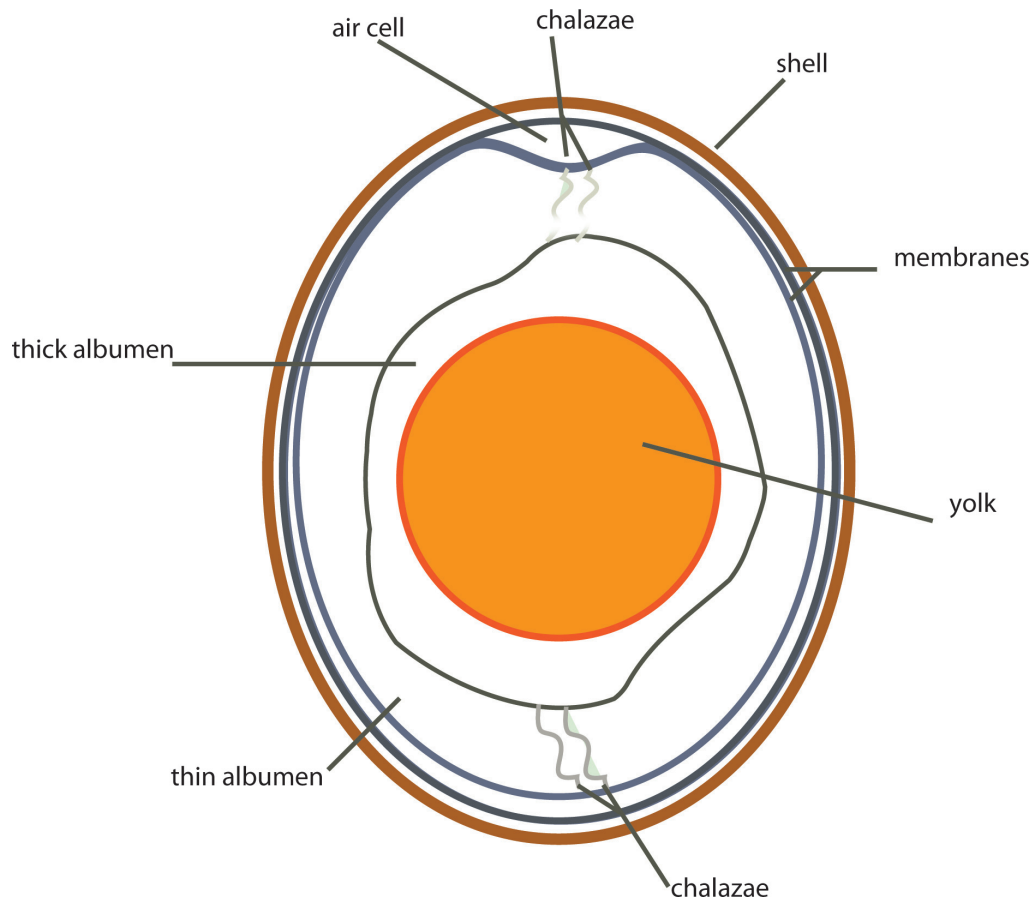
Students will draw the stages of egg development on the diagram provided. They must also label the hours it takes for each stage of development.



Teacher

Activity: What Makes up an Egg?

Have the students crack open an egg and use the egg as a reference to label the diagram of the egg provided.



Discussion Questions

What part of the egg development process take the longest? *Creating the shell takes the longest.*

What time of day do you think eggs are usually laid? Why? *The eggs are usually laid in the morning. It takes a lot of energy for a hen to create the shell of an egg so the majority of the shell creation is done while the hen is sleeping.*

Why do you think there is a thicker albumen (egg white) around the yolk? *To protect the yolk from being broken.*

Could a chick develop inside the eggs we eat? *No. Most eggs come from farms that do not have a rooster in amongst the flock therefore the egg could not be fertilized. Even if there is a rooster in the flock the eggs are collected within hours after being laid. They are therefore not incubated so a chick can not develop.*

Egg Development Activity

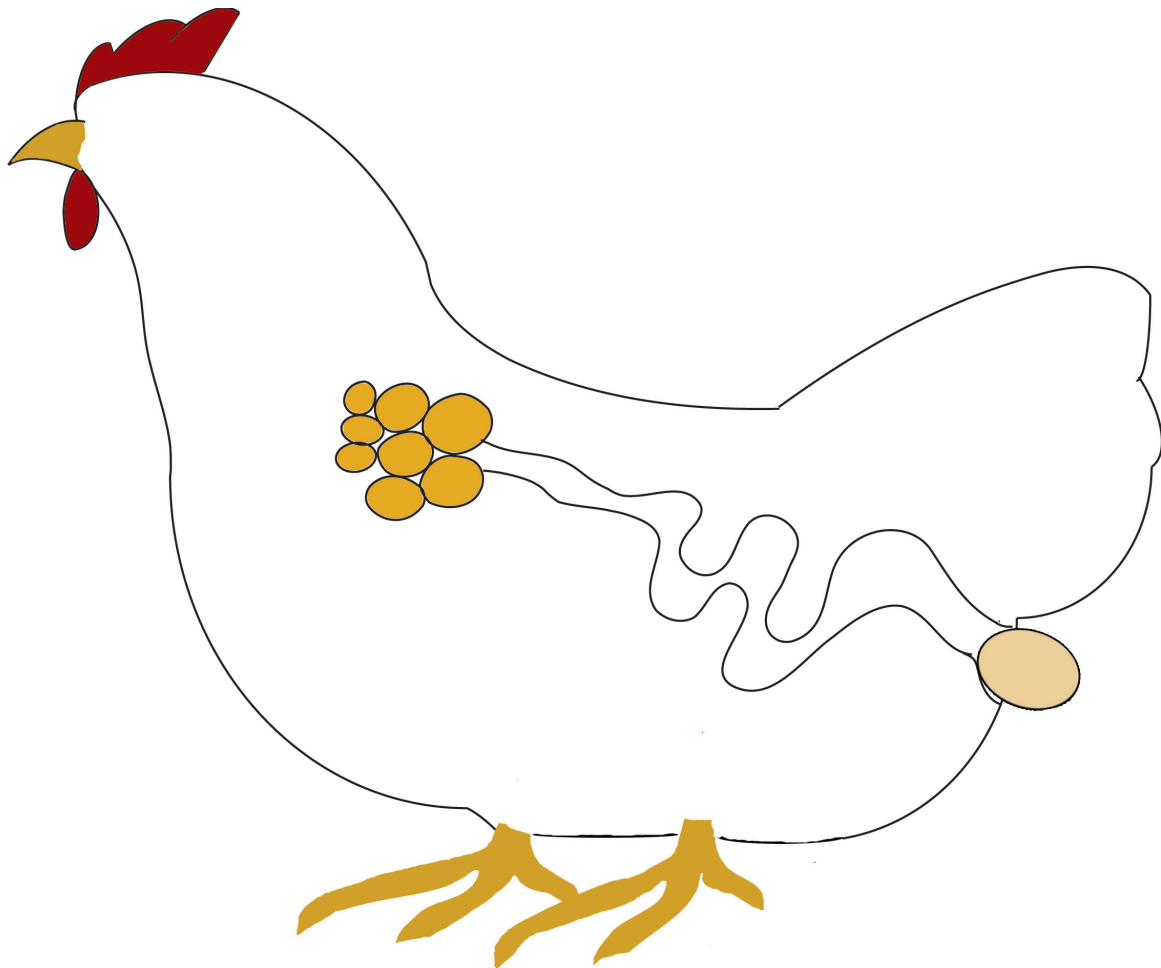
It takes a hen approximately 24 hours to lay an egg.

Label the ovaries in the diagram below.

Draw the following stages of the egg being developed.

1. the yolk being released into the oviduct
2. the yolk with white being collected
3. the membranes/shell being formed around the yolk and white

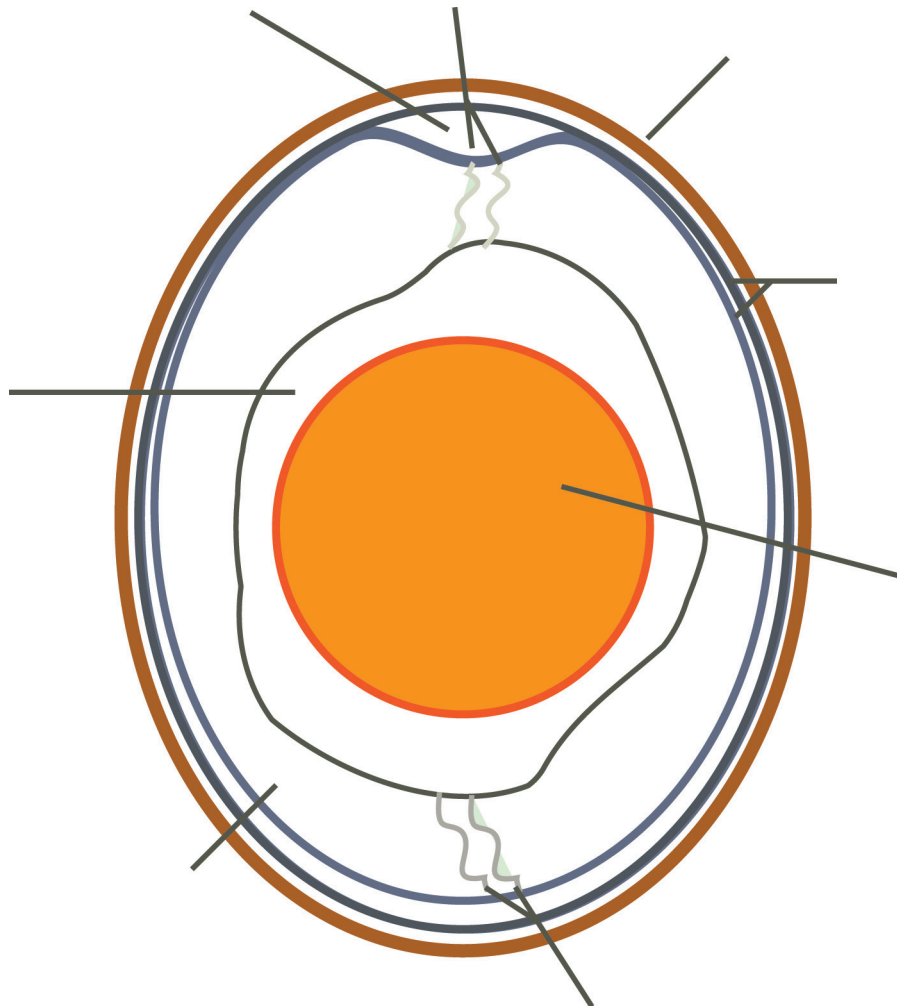
For each stage also write down the hours that it takes to get to that stage from when the yolk was first formed.



What makes up an egg?

After cracking open a real egg use it as a reference to label the diagram below with the following information labels:

1. yolk
2. chalaza (stringy bits that hold the yolk in place)
3. shell
4. membrane
5. thin albumen
6. thick albumen
7. air cell



Teacher

Egg Facts: Background Information

When hens are ready to lay their eggs, they usually look for a quiet secluded nesting place. In all housing systems with the exception of the caged system, nesting boxes are provided for hens. The nest box can be either a smaller communal space with a covered area to provide some privacy or it can be an individual nest box that hens share because they don't all lay their eggs at the same time. In free range and free run systems eggs are sometimes laid on the floor so farmers must walk through the barn regularly to collect those eggs.

Eggs sold in stores are either white or brown. The colour of the shell has nothing to do with how the hens were raised or the nutritional value of the egg. The egg shell colour is determined by the breed of chicken.

Likewise, yolk colour does not mean that one egg is more nutritious than another. Some yolks are darker yellow than others. The colour of the yolk is determined by the diet fed to the hens and the carotenes in that diet. Carotenes are yellow or red pigments found in certain foods. If foods high in carotene are included in a hen's diet the yolk in the egg she produces will be darker in colour.

A hen's diet also affects the Omega-3 content of her eggs. Omega-3 is a fatty acid important to good health. Flax seed is a good source of Omega-3 fatty acids. Some farmers feed their hens a 10-20% flax seed diet which produces eggs with a higher content of Omega-3 fatty acid. These eggs are then sold as Omega-3 eggs.

Sometimes an egg shell will appear to have slightly different shades of colour. This is due to extra calcium on the shell. The extra calcium forms on the shell in the shell gland when a hen holds in an egg that is ready to be laid. She will do this if she can't find a suitable nesting spot.

A hen does not require a rooster to produce an egg. The majority of eggs in stores are unfertilized. This is because most farmers do not include a rooster amongst their flock. If a rooster is put in with the hens, then some eggs may be fertilized but because they are collected quickly and refrigerated, there is no chance for an embryo to develop. If you see a white circle on the yolk that seems to indent the egg, this indicates that the egg is fertilized, but it is still safe to eat.

Nutritional value of eggs: Eggs contain protein which includes all of the essential amino acids, as well as many B vitamins which are important to good health. The nutritional value of an egg is divided between the egg yolk and the egg white. A large egg contains 6 grams of protein; 2.8 grams of it is in the yolk while the other 3.2 grams is in the white.

Egg yolks are one of the few foods that naturally contain vitamin D.

Discussion Questions:

Why are yolks different colours? *It depends on how much carotene is in the food that the hens eat. The more carotene in their food, the darker the yolk.*

Why are egg shells different colours? *The shells of eggs are determined by the breed of hen, not what they eat.*

Teacher

Does the housing system in which hens are raised have any affect on their eggs' nutritional value, colour of the egg shell or colour of the yolk? *No, it makes no difference.*

Can a farmer affect the yolk colour? Omega-3 content? *Yes. Marigold petals are often added to chicken feed so that the yolk will be darker. In order to increase the Omega-3 fatty acid in a yolk farmers add flax seed to the feed.*

Why do some eggs in the same carton sometimes have a slightly white/pink colour? *It is because extra calcium is on the shell due to a hen holding an egg in the shell gland for longer than usual. Calcium continues to be added to the shell until the egg is laid.*

Activity: What's in your egg?

Ask students to look at the carton of eggs they have at home and note if they are caged, free run, free range, Omega-3, organic and/or SPCA Certified. Ask them to check if the eggs are brown or white and if the egg yolk is orange or yellow. Make a chart like the one below, on a large piece of paper to gather the information. Discuss the perception people have about yolk and shell colour. Discuss the findings.

	Brown Shell	White Shell	Orange Yolk	Yellow Yolk
Caged				
Free Run				
Free Range				
Organic				
SPCA Free Run				
SPCA Free Range				
Omega 3				
Other				

Teacher

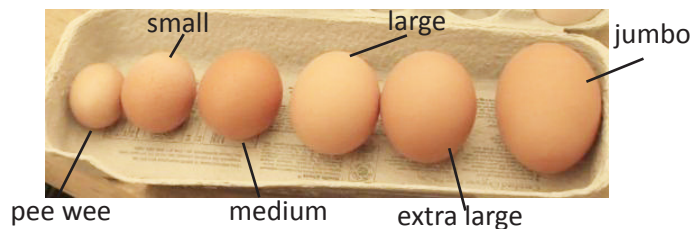
Grading Eggs: Background Information

Eggs are washed and graded for three reasons:

1. Food safety - the egg must be clean.
2. Size - consumers expect to be able to choose the size of egg, which is determined by weight.
3. Cracks - if there are cracks in the egg shell oxygen can get into the egg and break it down much more quickly than if the shell is intact. Cracks can be detected during candling.

Candling is the process by which eggs are inspected. Eggs pass by a strong light so that they can be assessed for their quality. Grade A eggs must have a thick white, a well-centered yolk, a small air cell and a clean, uncracked shell. Only grade A eggs are sold to stores and restaurants. Eggs are graded as follows:

1. Pee wee - under 42 grams
2. Small - at least 42 grams
3. Medium - at least 49 grams
4. Large - at least 56 grams
5. Extra large - at least 63 grams
6. Jumbo - 70 grams or more



Egg size is dependent on the age and breed of the hen. Young hens lay smaller eggs and certain breeds lay larger eggs than others.

Eggs that don't meet these criteria are used in commercial baking or sent to breaking plants to be processed and pasteurized. Some eggs may be separated into yolks and whites. Once the eggs are processed they are sent in bulk form to bakeries, restaurants and food manufacturers. Or they may be sent for use in non-food products such as pharmaceuticals, shampoo, pet foods, animal feed and adhesives.

Activity: Determine the Grade

Buy several different sizes of eggs (usually medium, large and extra large are sold at grocery stores). Take them out of the carton, mix them up and return them to the carton. Have students use a kitchen scale to weigh the eggs and use the grading chart to grade each egg according to weight. If you happen to find a cracked egg keep it in the carton and see if any of the students will notice.

Discussion Questions

Why are eggs graded? *To meet food safety requirements, to ensure the size is what the consumer expects to be in the carton, and to ensure the eggs don't have cracks or defects which may make the egg either not edible or not able to be kept to the best before date on the carton.*

Why don't farmers grade their own eggs? *Grading and packaging eggs is time consuming and an added expense. It is more efficient for eggs to be transported, graded, packaged and distributed from a central location.*

What happens to eggs that are cracked or don't pass the candling test? *Eggs that are cracked can still be eaten but they have to be used in a shorter period of time. These eggs go to a breaker where they are separated, pasteurized and sent to bakeries, restaurants or food manufacturers. Some eggs are also sent to be used in non-food products such as medicines or pet foods.*

Teacher

Meat versus Egg: Background Information

Chickens used for meat, such as chicken wings, thighs and breasts, are all raised in a free run system. Cages are not used to house/raise broiler (meat) birds. Some farms may allow their birds access to the outdoors and would therefore be free range.

Broiler chickens are a different breed of bird than egg-layers. Common chicken breeds are Arbor Acres, Ross, Peterson or Hubbard, while egg-layers are usually Leghorns or Rhode Island Reds. Broilers are bred to grow quickly, approximately three times the normal rate, and to have large breasts. A market weight broiler at six weeks weighs approximately 2 kg whereas an egg-layer at six weeks is approximately 500 g or 0.5 kg.

The reason broilers have been bred for fast growth and for large breast meat is a result of a steady increase in consumption of chicken by consumers and the demand for white meat over the last 10 to 20 years.

This comes with its own welfare issues. Birds raised for meat typically live on the floor level of a litter floor barn. They do have the freedom to move about but do not have places to perch. Because their skeletons must support so much muscle mass they can suffer lameness and have heart issues. They grow so quickly they are ready for slaughter at just six weeks of age. By comparison, egg-laying hens are very small; they only start laying eggs at 20 weeks of age and are usually kept in production for 18 months (78 weeks).

The other difference between meat chickens and egg-laying chickens is that only females can be used for egg production. All male chicks born into the egg-laying hatchery are disposed of while both male and female chicks grow up to be broiler chickens.

Discussion Questions

Show the students the image of the growth comparison between a laying hen and meat chicken on the following page. Discuss the following questions.

Why do meat birds grow so quickly? *They have been bred to grow quickly and to produce large breasts to meet consumer demand.*

Why has the consumption of chicken increased steadily over the past 10-20 years? *People believe that chicken is healthier than other meats such as pork and beef.*

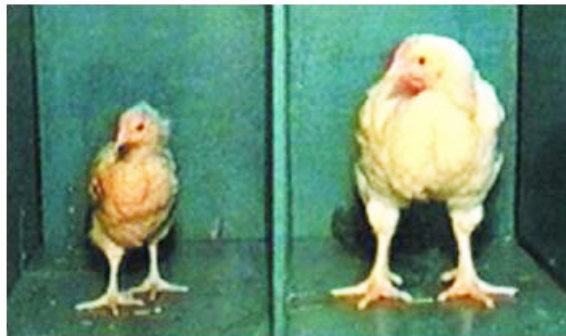
If chickens grow to their slaughter weight by six weeks how many flocks can a farmer have in one year? *Farmers usually need at least one week between flocks to clean the barn and get it ready to introduce a new flock of day-old chicks. Therefore, a farmer can have seven flocks of chickens every year.*

Laying hen

Meat chicken



Day 2



Day 9



Day 45

Laying hen and meat chicken growth comparison

After only 45 days the meat chicken (right) is significantly larger than the laying hen (left)

Teacher

What to Buy?: Background Information

The Egg Producers of Canada and the B.C. Egg Marketing Board are mindful of consumer demand when it comes to the production of eggs. The number of eggs consumed, the types of eggs consumed and the amount of product that can be produced locally and within Canada are factors they consider when they manage the egg quota system for farmers.

B.C. Egg Stats: In B.C. there are almost 2.4 million egg-laying hens. Approximately 88% of the 2.4 million hens are raised in caged housing systems. Of the 12% that are not raised in cages, roughly 36% are free run, 36% are free range and 29% are organic. The majority of B.C. egg producers farm in the Lower Mainland and Fraser Valley. There are about 130 egg farms and the average number of hens each raises is 17,000.

Most stores carry a variety of eggs. It is important for the consumer to know what the labels mean and to decide what factors are important to them.

Labels on Eggs: Besides being labeled free run, free range, organic or SPCA Certified there are other labels on eggs that may confuse the consumer.

Pasture-raised - Some farms choose to differentiate from free-range by using the term “pasture-raised”. They provide their animals with access to pasture and allow them to graze or forage (weather permitting), presumably for most of their lives. A claim like this needs to be further explained for the consumer to know exactly what it means. This wording is found on eggs, chicken, beef and pork.

Country fresh - These claims have no real meaning regarding the methods used to raise the animals or the actual quality of the products. The term “fresh”, for example, is not permitted on egg cartons.

Naturally Raised - “Natural” can only be used on meat, poultry and fish products if it can be proven that the animals were raised with minimal help from humans and were never given or administered substances including vaccinations, antibiotics, medications, veterinary drugs, hormones, direct fed microbials or formulated feeds. This is a very hard (almost impossible) claim to make under current Canadian labelling policies.

Non-medicated - This claim may be made if the animals are not exposed to any pharmaceutical drugs (eg. antibiotics) over the course of their lives, or if they were fed non-medicated feed. This claim gives no indication of how the animals were raised.

Raised without the use of hormones - This claim can only apply to beef cattle as they are the only animal allowed to have hormonal implants in Canada.

Maple Leaf Prime Naturally - Animals on these farms are raised in the same manner as other conventional farms. The company markets its products based on food safety and feed requirements, not on any special treatment of the animals.

Born 3 - These eggs come from conventionally raised, caged hens fed a unique diet that modifies the fat in the egg yolk.

Teacher

For the complete article on labels go to
<https://spca.bc.ca/faqs/spca-certified-foods-and-alternatives/>

Activity: What does it all mean?

Have students bring in an empty egg carton from home. Look at the egg cartons and see if there are any other claims/labels on the carton that may be confusing. Discuss what the students think the labels mean and then refer back to the labelling information to tell them what they really mean.

Discussion Questions:

What determines what type of eggs consumers buy? *Price, value set (e.g. animal welfare, environment, local).*

Why do some egg cartons put claims on them that have no real meaning? *They are trying to market themselves differently to appeal to the consumer.*

Why do eggs vary so much in price? *The cost to house hens in cage-free systems requires more land and is more labour intensive; therefore, these hens are more expensive to raise. Most cage-free farms have significantly fewer hens than caged systems. Certified organic and SPCA Certified eggs cost more for farmers to produce because they have to pay a fee to be part of the program. The B.C. Egg Marketing Board sets the price per dozen eggs that a farmer receives for each production system.*

Does Canada have a labelling police? *Yes. The Canada Food Inspection Agency has food labelling guidelines to help protect consumers from false claims on food packages.*

Teacher

Who is Dr. Ian Duncan?: Background Information



Dr. Ian Duncan was born and educated in Edinburgh, Scotland. He graduated B.Sc. (Hons) in Agriculture from Edinburgh University and went on to study for his Ph.D. at the Poultry Research Centre (PRC), Edinburgh (now the Roslin Institute, home of Dolly the sheep). Dr. Duncan studied frustration and conflict in domestic fowl. He was thus one of the first people to bring a scientific approach to solving animal welfare problems. He continued to work at the PRC on welfare topics in poultry for 20 years until he emigrated to Canada in 1989. He is a recently retired Professor of Applied Ethology (study of animal behavior) in the Department of Animal and Poultry Science at the University of Guelph and is the longest-standing University Chair in Animal Welfare in North America. In his research, he developed methods of “asking” farm animals what they feel about the conditions in which they are kept and the procedures to which they are subjected. He has published more than 150 scientific papers most of which are connected to animal welfare. Ian is also heavily involved in teaching, and his third-year undergraduate course on animal welfare currently has more than 180 students enrolled.

In June 2011, Dr. Duncan was presented with the first ever Universities Federation for Animal Welfare (UFAW) Medal for Outstanding Contributions to Animal Welfare Science.

In Canada, the University of British Columbia and the University of Guelph offer undergraduate and Graduate programs in Animal Welfare. Other universities such as the University of Saskatchewan offer Animal Science programs that do include animal welfare as part of the curriculum.

Discussion Questions

Is it important to have scientists study animal welfare? *Scientists can help people understand the preferences of animals have and the ways the lives of animals can be improved based on their research. If no one did this it would be difficult to make changes to systems that may not treat animals in a humane way.*

How does scientific research affect business in general? In farm animal production? *Scientific research influences business all the time. New discoveries in medical research have found cures for diseases, influenced people’s daily choices and changed ways in which businesses run.*

Science influences farm animal production not only in how animals are housed but also in how to reduce lameness or increase production. Science doesn’t always take animal welfare into consideration but animal welfare science is one branch of animal science that has evolved over time.

Animal welfare science has influenced several restaurant chains to change their purchase of eggs to a percentage of cage-free eggs. In the United States, Burger King, Subway and Wendy’s have committed to purchase some of their eggs from cage-free farms. They say the percentage will increase as more farmers shift to these methods and more competitively priced supplies become available.

Check out some of the research done by students in the UBC Animal Welfare program
<http://www.landfood.ubc.ca/animalwelfare/publications/theses.htm>

Extension
Activities

Teacher

Home Sweet Home?: Background Information

The battery cage farm in the video housed approximately 33,000 hens and is 14,400 ft² (13,378,038cm²). The barn at Rabbit River Farms houses 5,000 hens and is 12,160 ft² (11,297,009 cm²). The barns don't use the entire space for hens. There is equipment and walking space as well. Each farm employs the same number of employees. The mortality rate of hens is very similar. So why would a farmer choose to house hens in a way that is more expensive than other housing systems?

For the activity below students will calculate the numbers of hens as if the whole space was used entirely for hens. To give a more realistic comparison in hen numbers (6:1 ratio of caged birds to free range birds as seen in the video) the students will calculate the caged hens at three cages stacked even though the video showed four cages stacked. Please discuss this information with students.

Activity: Home Sweet Home?

Challenge students to use their math skills with the information provided. Given the measurements for a barn, the students will determine the number of hens, eggs and income per month for each housing system.

	Caged	Free Run		Free Range		SPCA Free Run		SPCA Free Range		Organic
		slats	litter	slats	litter	part slats	litter	part slats	litter	
hens	83,100	14,000	7,000	14,000	7,000	12,000	7,000	12,000	7,000	8,000
eggs	2,493,000	420,000	210,000	420,000	210,000	360,000	210,000	360,000	210,000	240,000
dozen eggs	207,700	35,000	17,500	35,000	17,500	30,000	17,500	30,000	17,500	20,000
in- come	\$421,700	\$86,500	\$43,200	\$109,600	\$54,800	\$74,100	\$43,200	\$74,100	\$43,200	\$77,600

Discussion Questions

Why would a farmer choose to house hens in a way that is more expensive than other housing systems?

What do the majority of consumers buy and why?

Should animal welfare be considered when raising animals for food? Who should determine the level of welfare required?

If you were starting an egg farm business which would you choose and why?

Home Sweet Home?

cm²/hen

		all wire/slats	all litter	partial slats
Caged*	483			
Free Run*		950	1900	
Free Range*		950	1900	
SPCA Certified (free range or free run)			1900	1111
Organic (always free range)			1666 + 2500 outdoor space	1666 + 2500 outdoor space

* as outlined in the Canadian Codes of Practice for Poultry-Layers

1. Using the table above, determine the number of hens that can be kept in a barn for each housing system that is 13, 378,038 cm². (Remember that cages can be stacked, so you will have to calculate the number of hens for floor space x 3 high). Round your answers to the nearest 100. Write your answers in the table below.

2. Using the numbers from your table above, calculate how many eggs are produced in one month, based on a hen laying an egg every 24 hours. Write your answers in the table below. Then calculate how many dozen of eggs this equals and write this in the table below.

3. Below is the price farmers get per dozen of large eggs. Calculate the monthly income for the farmer for each housing system. Write your answers in the table below

Price per dozen of large eggs

Caged: \$2.03

Free Run: \$2.47

Free Range: \$3.13

Organic: \$3.88

	Caged	Free Run		Free Range		SPCA Free Run		SPCA Free Range		Organic
		slats	litter	slats	litter	part slats	litter	part slats	litter	
hens										
eggs										
dozen eggs										
income										

Teacher

A Farmer's Perspective: Background Information

All egg farmers with more than 99 hens in B.C. become part of the B.C. Egg Marketing Board (BCEMB). The BCEMB issues licenses to farmers who have between 100-399 hens. If a farmer has more than 399 hens they must apply to be part of the national egg quota system. The system is regulated so that consumer demand can be met while ensuring a fair market value for the farmer and consumer.

In B.C. there is specific quota set for specialty eggs and a separate quota for caged eggs. The quota system is based on the market demand. Provincial quota is determined by the national egg group call the Egg Farmers of Canada (EFC). Taking into account how many eggs consumers eat across Canada, plus the number of eggs sold inter-provincially and imported from the USA, EFC allocates quota to each province. The BCEMB then distributes the B.C. quota to B.C. farmers, both current and new, to meet the egg preferences of consumers. In B.C. consumers are buying more specialty eggs (Free Run, Free Range, Organic and SPCA Certified), therefore, there are more specialty egg producers in B.C. than in the rest of Canada.

Activity: A Farmer's Perspective

Students will watch the video produced by the BCEMB on the internet. They will then answer some questions using critical thinking skills.

A Farmer's Perspective

Watch the video produced by the B.C. Egg Marketing Board at <http://www.bcegg.com/files/farmers-care-video.php> and answer the following questions.

What is the overall message of the video?

Does it promote free run, free range and organic farmers?

Does it promote farmers who have caged hens?

Since all farmers who have 400+ hens must become part of the B.C. Egg Marketing Board would you feel that your product is well-represented in this video if you were a farmer who didn't raise hens in a caged system?

What are some reasons given why B.C. eggs couldn't all be produced in cage-free housing systems?

If all eggs were cage-free would this increase employment opportunities? Decrease the price of free run, free range and organic eggs at the grocery store?

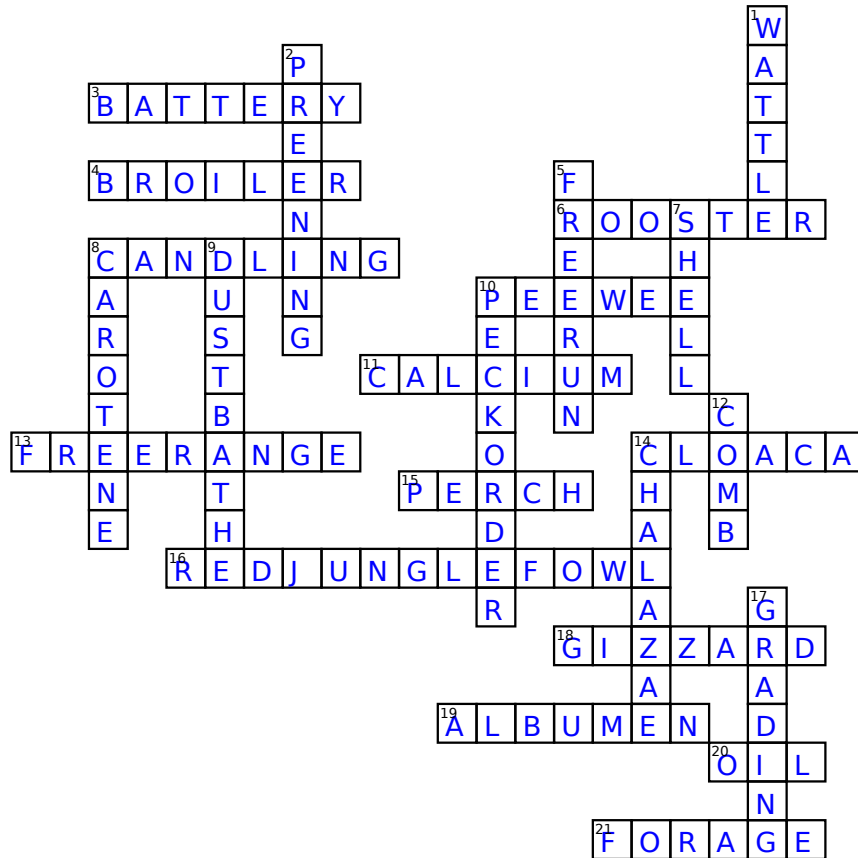
The majority of eggs farmers in B.C. have farms in the Fraser Valley. Do other areas of the province have land that could be used for egg farming? What would be the benefits to having farms around the province rather than concentrated in the Fraser Valley? What would be the drawbacks?

What are the environmental impacts of each housing system?

Which one is the most beneficial to the environment? Which one is the most detrimental? Why?

Providing affordable healthy food is important. How could prices be kept low if only cage-free eggs were available to consumers?

Egg-laying chickens



Across

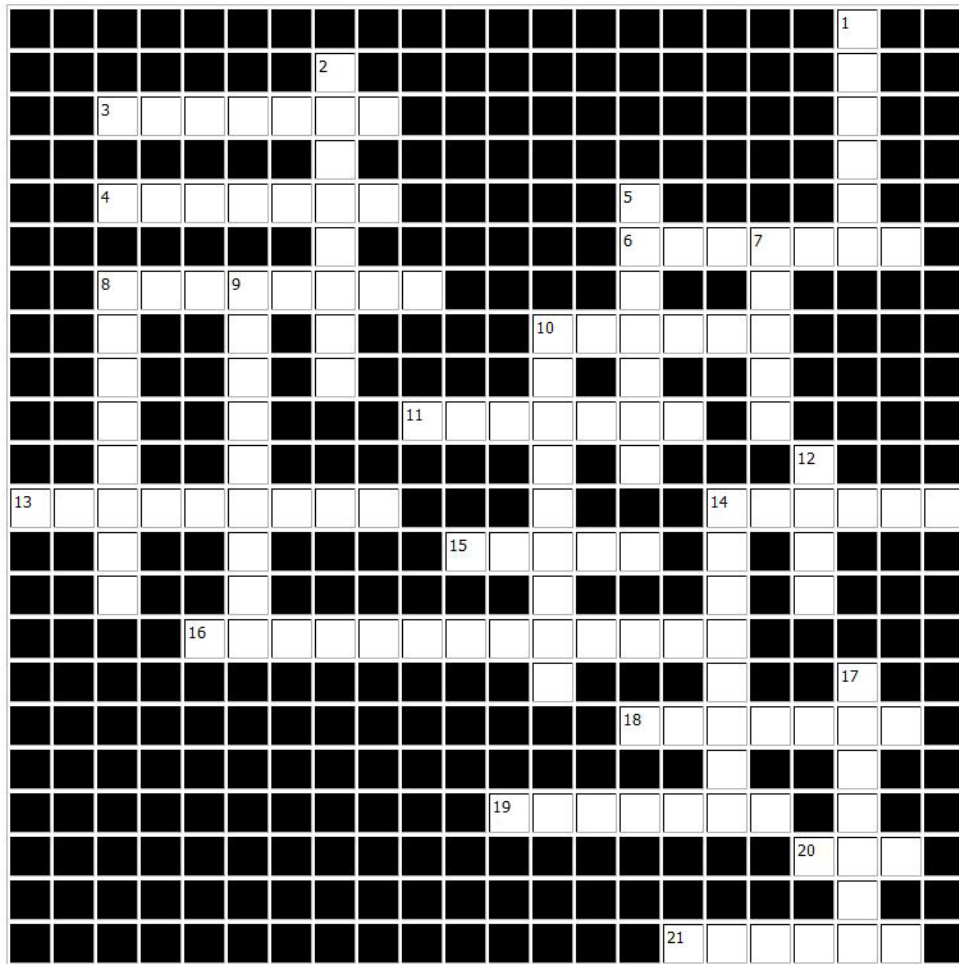
- 3. typical cage used to house hens
- 4. chicken raised for meat
- 6. male chicken
- 8. passing by a light to see the inside of an egg
- 10. egg under 42g
- 11. mineral used to help produce the egg shell
- 13. housing chickens with both inside and outside access
- 14. opening from which a hen poops and lays an egg
- 15. to rest on a branch
- 16. ancestor of the domestic chicken
- 18. organ where food is ground up
- 19. the white part of an egg
- 20. used to waterproof feathers
- 21. to look for food and stones in the dirt

Down

- 1. fleshy dangling skin under a chicken's beak
- 2. the way a chicken combs her feathers
- 5. housing of hens freely inside a barn only
- 7. outer covering of an egg
- 8. yellow or red pigment found in food
- 9. to use dirt to remove stale oil from feathers
- 10. social ranking of a flock
- 12. fleshy skin on top of a chicken's head
- 14. stringy bits inside an egg that hold the yolk in place
- 17. method of categorizing eggs by weight

Crossword Puzzle

Egg-laying chickens



Across

- 3. typical cage used to house hens
- 4. chicken raised for meat
- 6. male chicken
- 8. passing by a light to see the inside of an egg
- 10. egg under 42g
- 11. mineral used to help produce the egg shell
- 13. housing chickens with both inside and outside access
- 14. opening from which a hen poops and lays an egg
- 15. to rest on a branch
- 16. ancestor of the domestic chicken
- 18. organ where food is ground up
- 19. the white part of an egg
- 20. used to waterproof feathers
- 21. to look for food and stones in the dirt

Down

- 1. fleshy dangling skin under a chicken's beak
- 2. the way a chicken combs her feathers
- 5. housing of hens freely inside a barn only
- 7. outer covering of an egg
- 8. yellow or red pigment found in food
- 9. to use dirt to remove stale oil from feathers
- 10. social ranking of a flock
- 12. fleshy skin on top of a chicken's head
- 14. stringy bits inside an egg that hold the yolk in place
- 17. method of categorizing eggs by weight

Other Suggested Activities

Drama

Students create a play in which they are:

1. A reporter interviewing hens/farmers from different farms on how they feel about their conditions.
2. A hen fighting for her rights to the Five Freedoms (Freedom from hunger and thirst, Freedom from pain, injury, and disease, Freedom from distress, Freedom from discomfort and Freedom to express behaviours that promote well-being.)

Art

- Chicken eye view of the world
- Posters comparing production methods
- Chicken sculpture
 1. Paper mulch
 2. Paper mache
 3. Plastercine
- Cartoon strip

Language Arts

- Stories from chicken perspectives
e.g. Two chickens from different farms meet (similar to country mouse/city mouse)
- Chicken poetry
- Brainstorm familiar chicken phrases
 - Discuss if these portray positive or negative stereotypes, if negative
 - Change to reflect positively on the chicken and come up with a few of your own.

Media Literacy

- Chickens in media: Make a list of TV programs, movies or advertisements. that use chickens. Why are chickens being used? Is the message about chickens positive or negative? Does it reflect a natural chicken or an anthropomorphized (given human characteristics) chicken?
- Watch the movie "*Chicken Run*". Discuss which aspects of the movie were real and which weren't. Does this have any influence on how people/children view chickens as food?

