



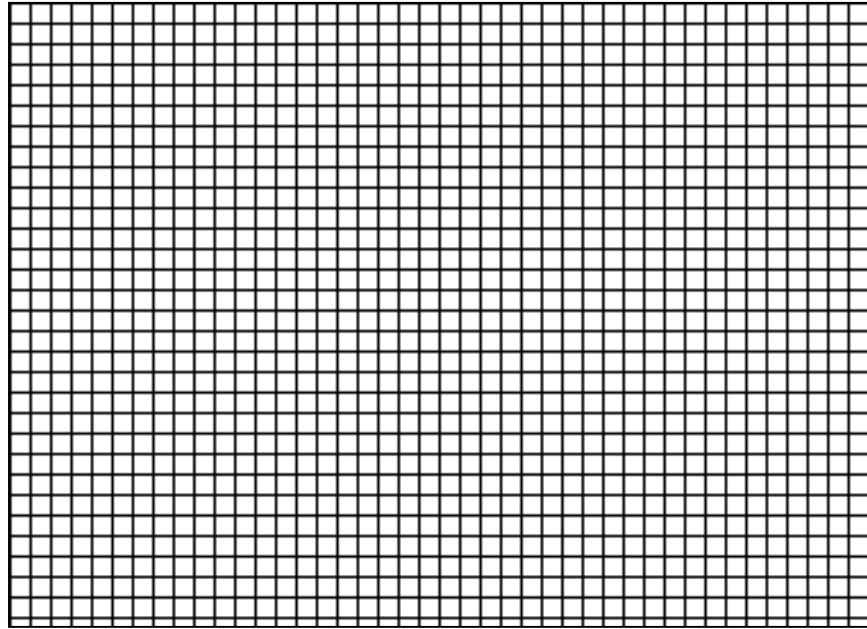
Grade 9 Lab Notebook
Science in Action 9

Index of Investigations, Challenges and Activities

Biological Diversity

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1.0 Biological diversity is reflected in the variety of life on Earth.			
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Skill PRACTICE
Exploring Wolf Population Trends (p. 6)



- _____

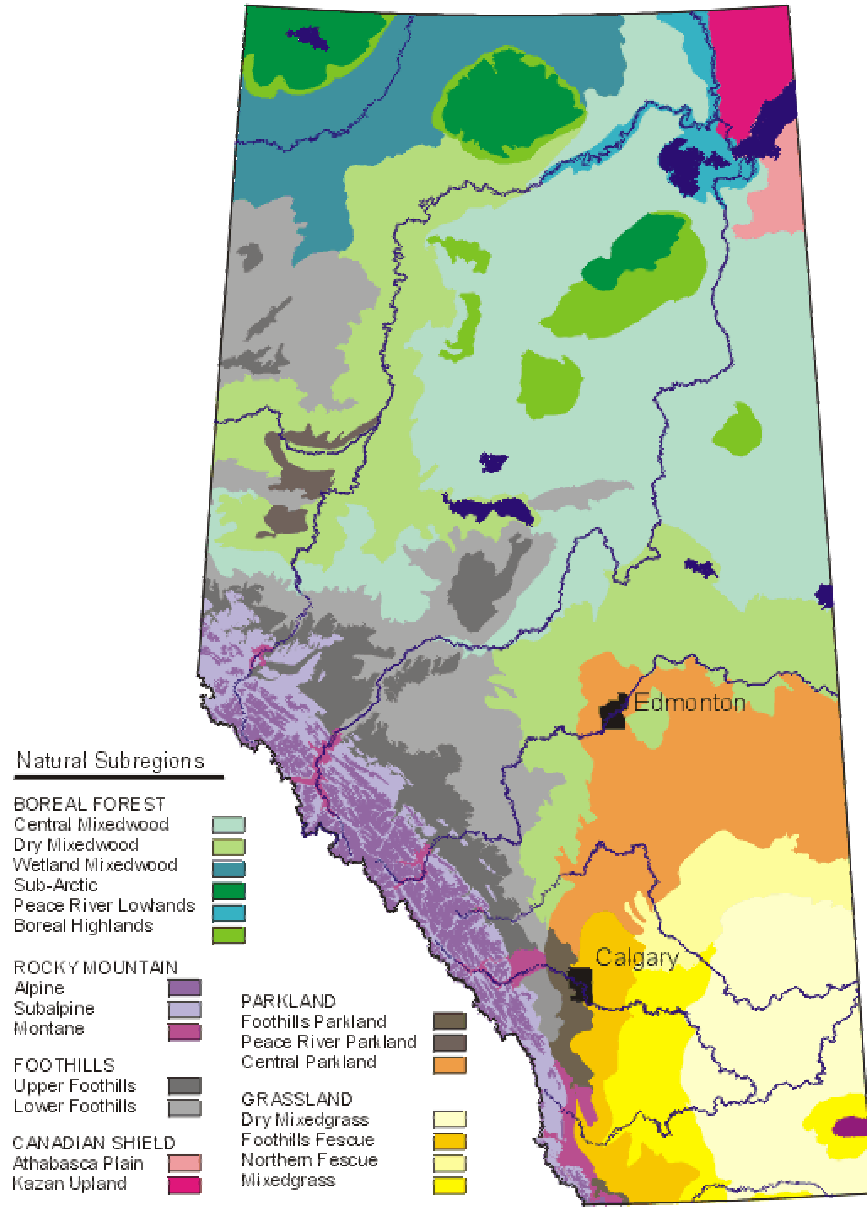
- _____

- _____



Give It A TRY Trekking Through Alberta's Landscape (p.10)

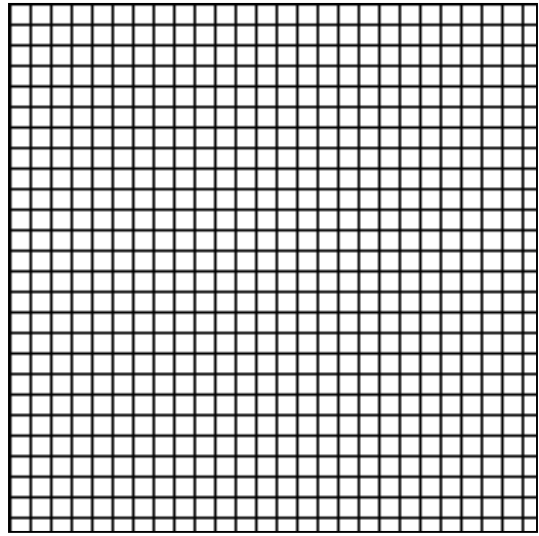
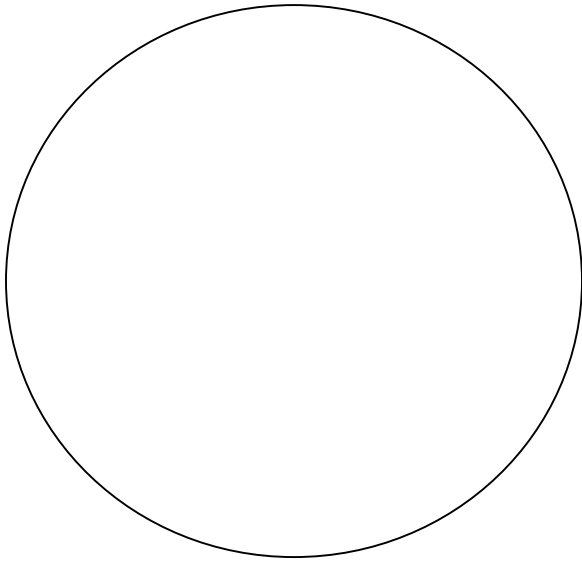
(Map source: [Alberta Government](http://www.alberta.ca) website)



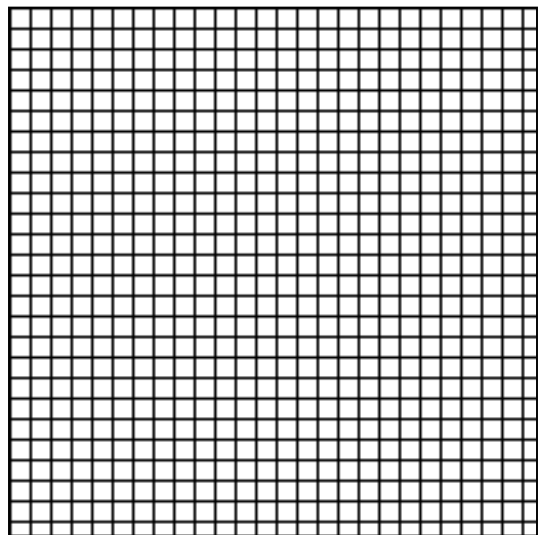
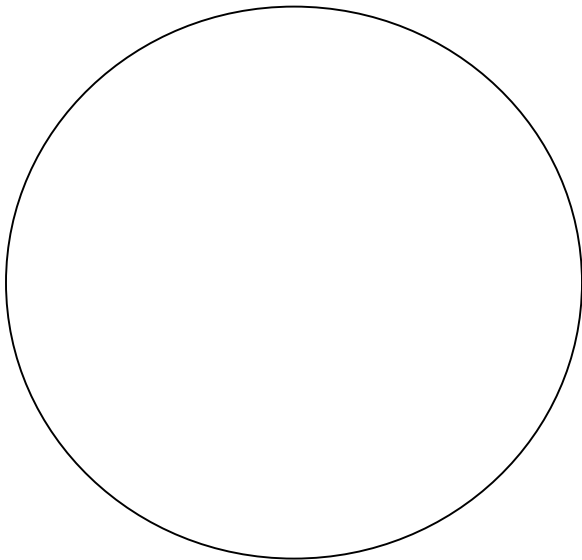
Natural Region	Species found in this region
Boreal Forest	
Rocky Mountain	
Foothills	
Canadian Shield	
Parkland	
Grassland	

Skill PRACTICE Representing Data (p. 13)

Data Set 1 - Fruit Fly Data



Data Set 2 - Virus Data



Problem Solving A-1

Representing Biological Diversity (p. 14)

Question: How can diversity (Chart p. 14) be *visually represented* ?

Idea: _____



Test and Evaluate:

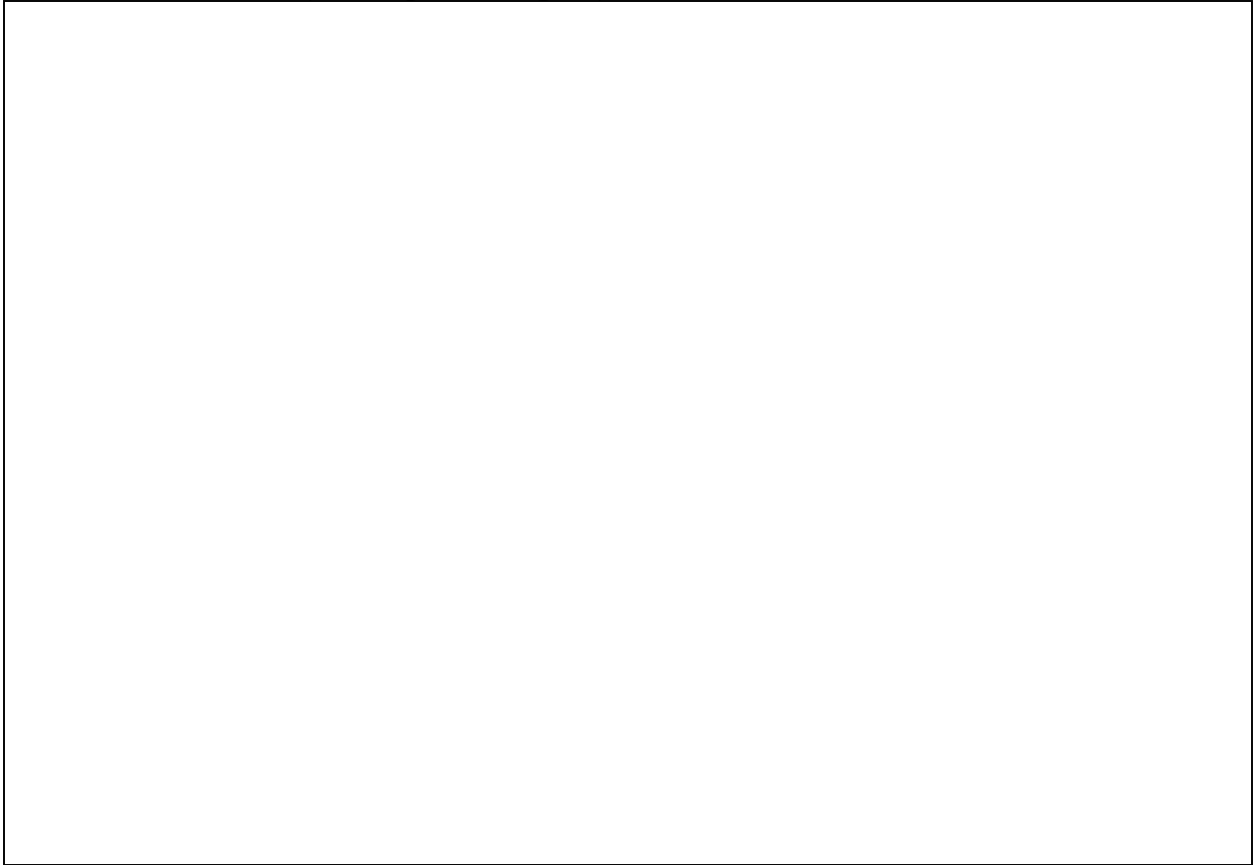
9. _____

Communicate:

10. _____

Quick LAB
Searching For Symbiosis (p. 18)

Scientific Illustration (close-up view of galls)



Questions:

5. _____

6. _____

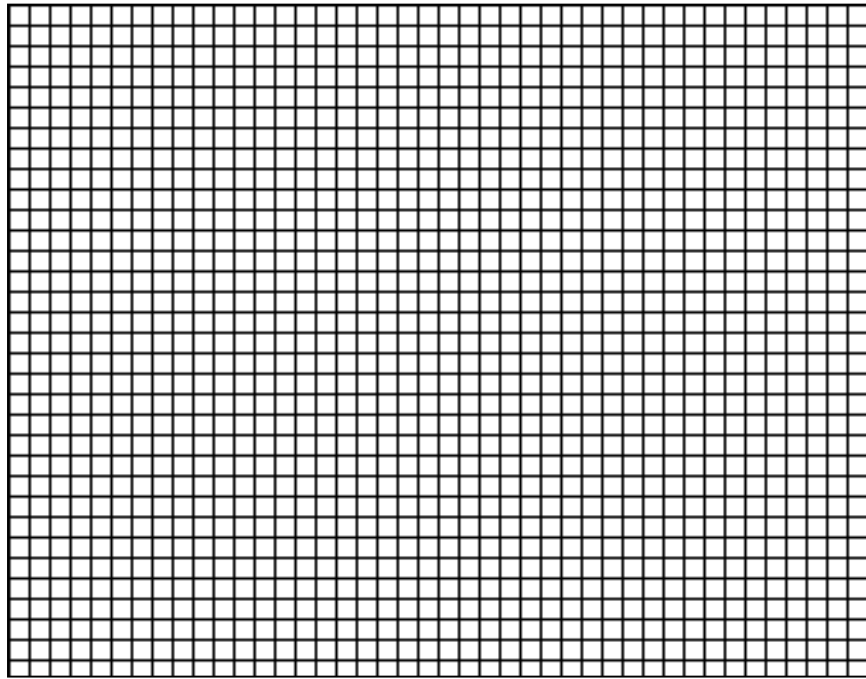
7. _____

Skill PRACTICE

Measuring Variation In The Human Hand (p.21)

Hand span (cm)	12 or less	13 - 16	17 - 20	21 - 24	25 - 28	29 or more
----------------	------------	---------	---------	---------	---------	------------

Number of Students



- _____
- _____
- _____
- _____

Inquiry A-2

Protective Coloration and Survival (p. 22-23)

Question: Does the color of an organism affect the organism's chance of survival?

Hypothesis: _____

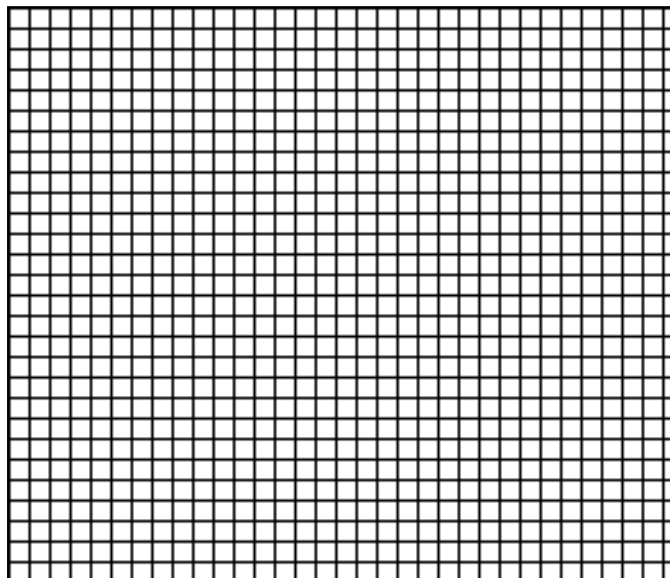
Materials and Procedure: (p. 106-107)

Data Collection:

Observations of Populations	# of Color 1	# of Color 2	# of Color 3
Generation 1			
Survivors of Selection 1			
Generation 2			
Survivors of Selection 2			
Generation 3			
Survivors of Selection 3			
Generation 4			
Survivors of Selection 4			
Generation 5			
Survivors of Selection 5			

Analyzing and Interpreting:

11.



12. _____

13. _____

14. _____

Forming Conclusions:

15. _____

Applying and Connecting:

a) _____

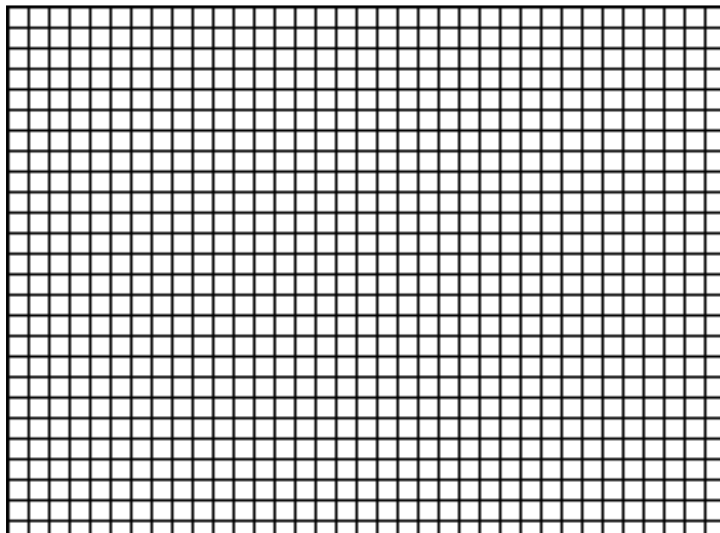
b) _____

Give It A TRY

Observing Variation In Human Characteristics (p. 27)

Variation	Boys	Girls	Total
Bent thumb			
Straight Thumb			
Attached Earlobe			
Free Earlobe			
Widow's Peak			
Straight/curved hairline			

TITLE OF GRAPH _____



KEY

Bent thumb		Attached Earlobe		Widow's Peak	
Straight Thumb		Free Earlobe		Straight/curved hairline	

Give It A TRY

Is It Discrete Or Continuous? (p. 29)

Action	Right Preference	Left Preference	Type
Clasping hands			continuous discrete
Folding Arms			continuous discrete

Skill PRACTICE

Representing Asexual Reproduction (p. 31)

Binary Fission	Budding
Spore Production	Vegetative Reproduction

Inquiry A-3

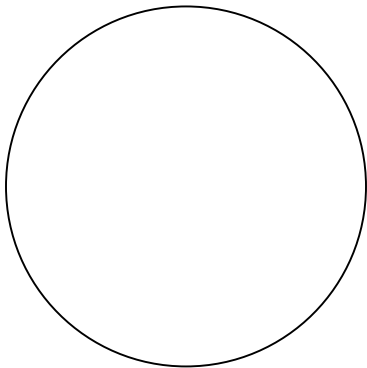
Investigating Flower Reproductive Structures (p. 24)

Question: What are the reproductive structures of a flower?

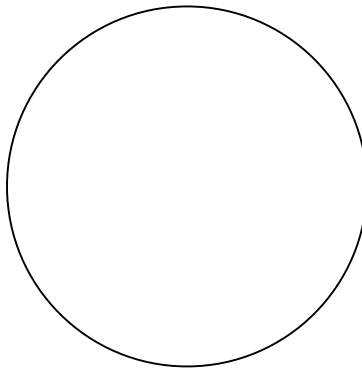
Hypothesis: (Prediction)

Before Dissection	After Dissection

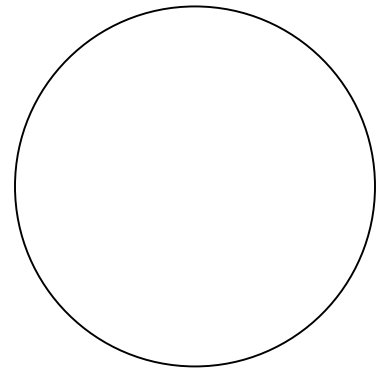
Microscopic View of Pollen



(x)



(x)



(x)

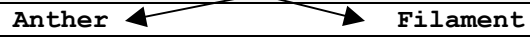
Data Collection (Information Cards)

Pollen

Petals

Blank area for drawing or notes related to Petals.

Stamen



Blank area for drawing or notes related to Stamen.

Pistil

Blank area for drawing or notes related to Pistil.

Ovary

Blank area for drawing or notes related to Ovary.

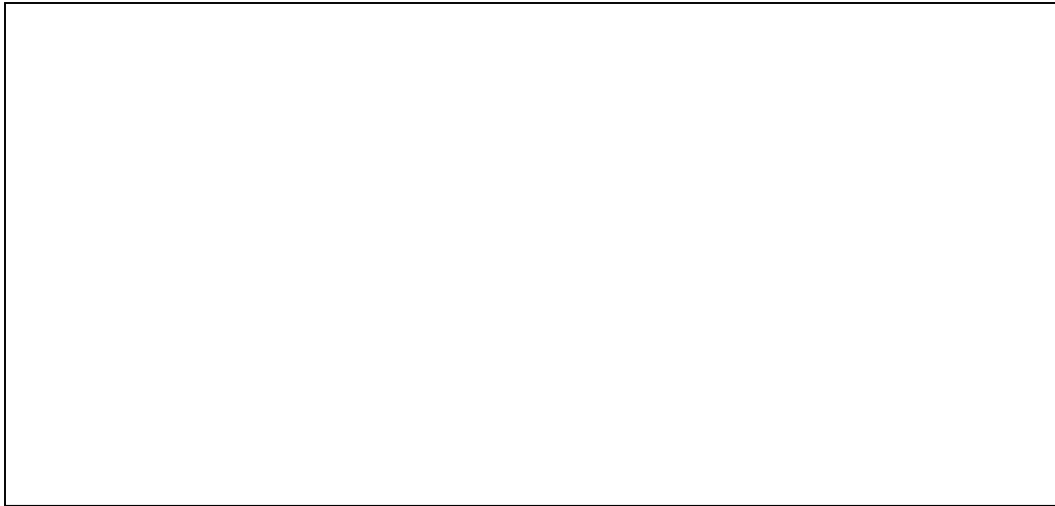
Analyzing and Interpreting:

8. _____

9. Sketch (Prediction)

10. _____

11. Sketch of Flower Reproductive Structures



12. _____

Forming Conclusions:

13. _____

Give It A TRY Super Dogs (p. 39)

Breed	Special Task	Fame

Breed of Dog Chosen _____	
Characteristics of Breed helping it do what it is good at. (What makes it a Superdog)	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Decision Making A-4

Useful Genes? (p. 42)

Issue: What are the questions and issues raised by new technologies for recombining genetic material?

Analyze and Evaluate: PART A

Cloning	Cystic Fibrosis	Muscular Dystrophy	Huntington's Disease
---------	-----------------	--------------------	----------------------

Treatment (Now)

Source: _____

Treatment (In the Future)

Source: _____

Questions or Issues:

Source: _____

Source: _____

Analyze and Evaluate:

PART B

Cloning

Artificial Reproductive Technology

Genetic Engineering

How this Technology works

Source: _____

Applications of this Technology

Source: _____

Questions or Issues:

Source: _____

Source: _____

Test and Evaluate:

5. _____

6. _____

Communicate:

7. _____

8. _____

9. _____

10. _____

Give It A **TRY**

Who Has What Number? (p. 48)

Organism	# of chromosomes in a cell at the end of mitosis	# of chromosomes in a body cell	# of chromosomes in a gamete	# of chromosomes in a zygote	# of pairs of chromosomes
cabbage	18				
black bear					38
human			23		
peanut	40				

Give It A **TRY**
Exploring *Genetic Possibilities* (p. 52)

long-leg / short-leg

• **Yes** **No** _____

• **Yes** **No** _____

• _____

red-eye / purple-eye

•	•	•
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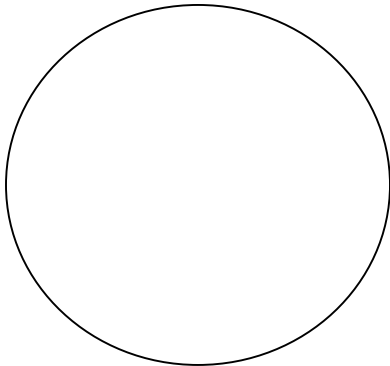
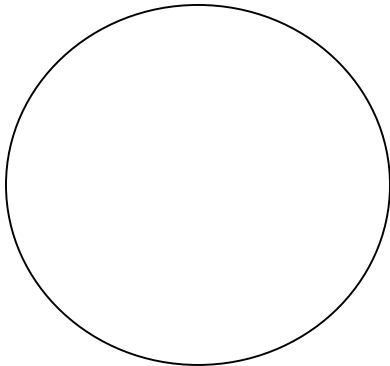
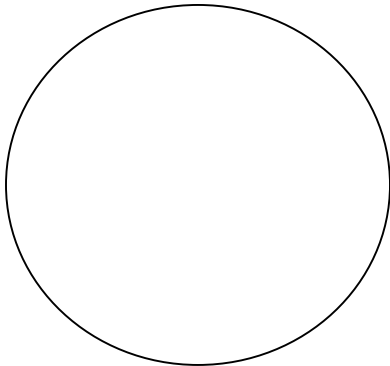
•	•	•
---	---	---

long-wing /short-wing

•	•	•
---	---	---

•	•	•
---	---	---

Possible fruit fly combinations



Give It A **TRY**
Choices In Our World (p. 57)

Scenario 1

Scenario 2

Effects of changes to the environment ...
Effects of changes to the organisms in that environment ...
Choices that need to be made ...
Why?
Could any of the changes have been avoided?
How?

Decision Making A-6

Balancing Act (p. 62)

Issue: Should human activities be restricted in our **National Parks**?

Opinion: _____

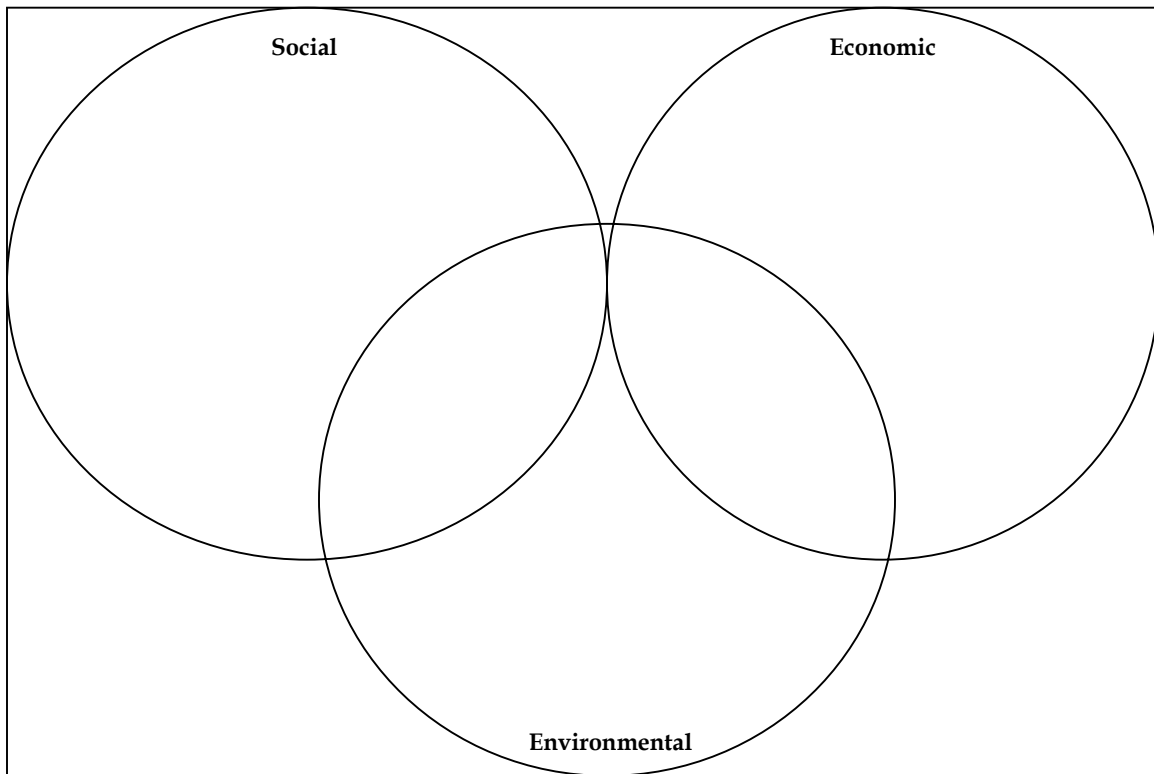
Background Information: (p. 63)

[Eastern slopes Grizzly Project](http://www.canadianrockies.net/Grizzly/int_mgmt.html) http://www.canadianrockies.net/Grizzly/int_mgmt.html

[Bear Country](http://www.worldweb.com/parkscanada-banff/bears.html) <http://www.worldweb.com/parkscanada-banff/bears.html>

[Threat to Grizzly Bears](http://www.cpaws.org/alerts/lake-louise-2001-0426.html) <http://www.cpaws.org/alerts/lake-louise-2001-0426.html>

Analyze and Evaluate:



Proposal: _____

Activities that should be allowed	Activities that should NOT be allowed

Brochure:

(Inside Panels)

--	--	--

(Outside Panels)

--	--	--

Experiment On Your OWN A-7
Changes In Biological Diversity (p. 64)

Question: How do the numbers of plant and animal species in an area change over time?

Hypothesis: _____

Study Area: _____

Materials needed:

Procedure: (Steps to follow)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Report on Your Results (Separately)

Decision Making A-8

Salmon Farming and Variability (p. 70)

Issue: Will **Salmon Farming** help or hurt the recovery of wild salmon in Canada?

Opinion: _____

Additional Background Information: (p. 70)

[What is wrong with salmon farming?](http://www.raincoastresearch.org/salmon-farming.htm)

<http://www.raincoastresearch.org/salmon-farming.htm>

[Salmon Farmers](http://www.salmonfarmers.org)

<http://www.salmonfarmers.org/library/issues.html>

[Salmon Farming Countries](http://www.seaweb.org/resources/sac/leading.html)

<http://www.seaweb.org/resources/sac/leading.html>

Analyze and Evaluate:

1.

Positive Impacts	Negative Impacts

2. _____

3. _____

4. **Position Statement :** **Fish Farmer** **Fish-farming Opponent**

Decision Making A-9

Saving The Whooping Crane (p. 77)

Issue: Which strategies have been most effective in saving the whooping crane from extinction?

Conservation Strategies:

Additional Background Information: (p. 77)

[The Cranes](http://www.portup.com/~nacwg/whooping.htm)

<http://www.portup.com/~nacwg/whooping.htm>

[Captive Propagation](http://www.npwrc.usgs.gov/resource/distr/birds/cranes/captive.htm)

<http://www.npwrc.usgs.gov/resource/distr/birds/cranes/captive.htm>

[Nature](http://www.mb.ec.gc.ca/info/publications/ap-pa/ce02s04.en.html)

<http://www.mb.ec.gc.ca/info/publications/ap-pa/ce02s04.en.html>

Analyze and Evaluate:

Conservation Strategy Report Card

Strategy	Mark	Strategy	Mark

Marking Key

A		C		E	
B		D		F	

Give It A **TRY**

Do You Affect Biological Diversity ? (p. 70)

Day	Activities	Biological Effect
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

Action Report
