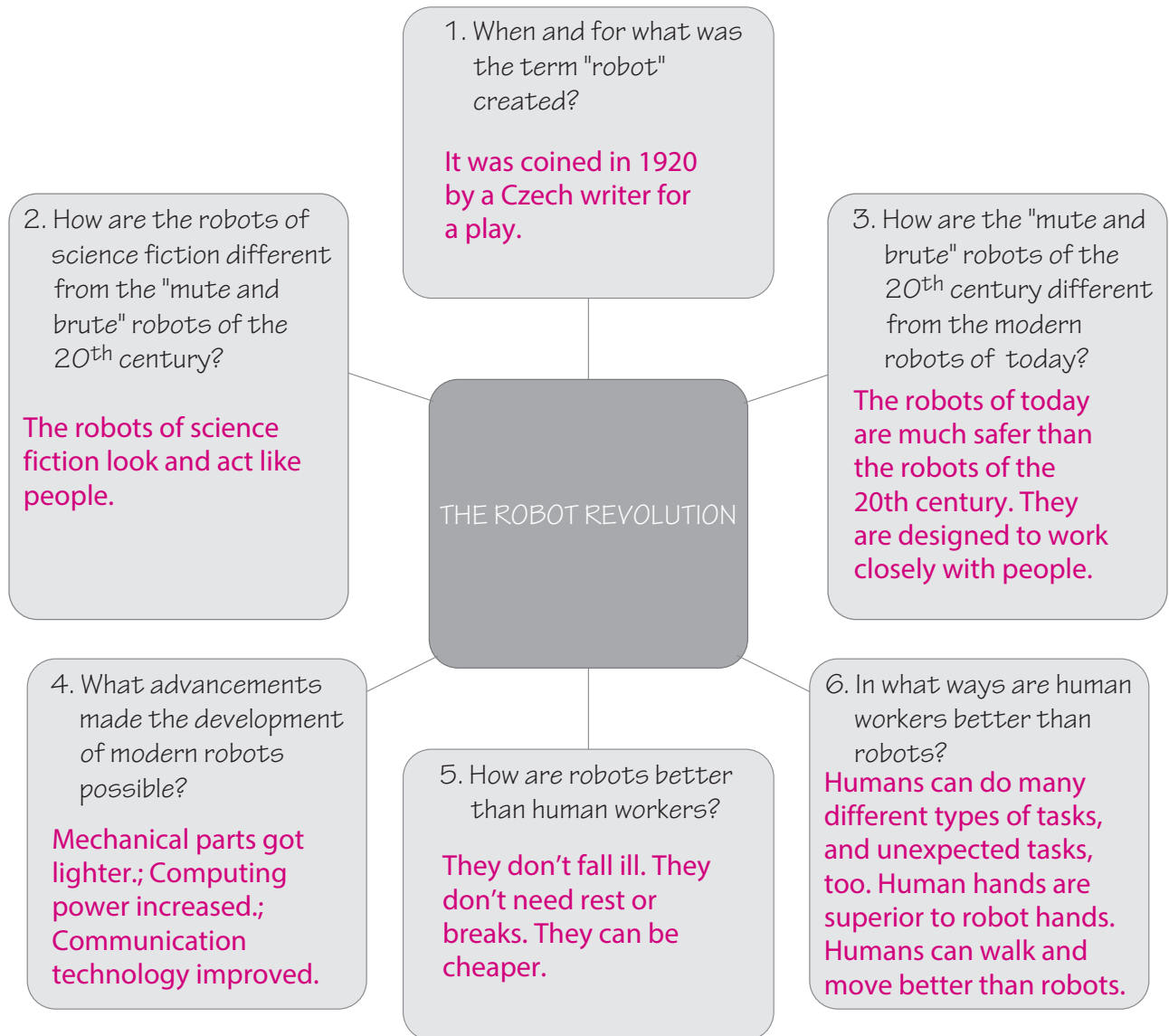


LEVEL 4 Graphic Organizers

UNIT 1: THE CHANGING WORKPLACE

Complete the concept map as you read *The Robot Revolution Has Arrived*.

Suggested answers:



## LEVEL 4 Graphic Organizers

## UNIT 2: CITY CHALLENGES

Answer the questions as you read *Wild Cities*.

Suggested answers:

**A. Where in the U.S. can bears, coyotes, and raccoons be found, according to the article?**

Black bears can be found in about 40 states in the U.S.

Coyotes can be found in every U.S. state except Hawaii.

Raccoons can be found in many U.S. cities (they are “expanding throughout North American cities”).

**B. How are bears, coyotes, and raccoons similar? Give examples where possible.**

All three animals are adaptable:

Bears are able to live close to people and eat human food.

Coyotes are able to eat a lot of different types of food.

Raccoons are able to change their behavior (they are more social in urban environments). They are also able to eat many different types of food.

**C. How are bears, coyotes, and raccoons different? Give examples where possible.**

Bears and coyotes can be aggressive, but raccoons generally aren’t.

Coyotes and bears tend to avoid people, while raccoons try to live close to them.

Raccoons are better problem solvers than coyotes, and probably bears (they are able to solve puzzles significantly quicker than coyotes).

**D. How does the article suggest people respond to the problem of urban wildlife?**

The article suggests that humans should learn to coexist with urban wildlife and find joy in their encounters with them.

## LEVEL 4 Graphic Organizers

## UNIT 3: ART AND BEAUTY

Complete the chart as you read *Making an Impact Through Art*.

Suggested answers:

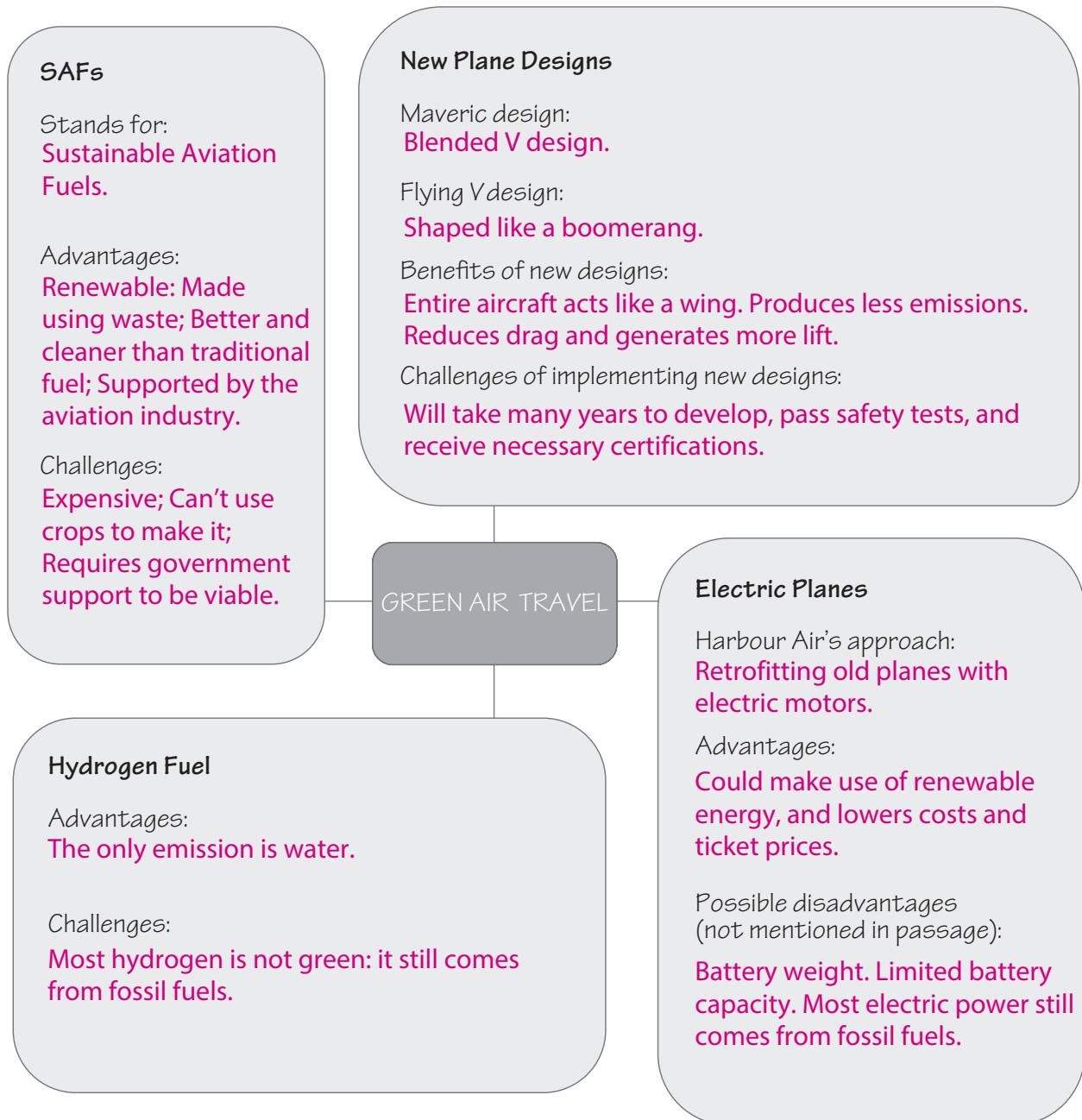
	Sophie Green's Art	DRC sculptures	Origami
What makes it special?	Her paintings are very realistic.	They are made using waste materials found locally.	Its principles are not fully understood by science.
How is it made?	Sophie Green uses acrylic paint. She starts with dark colors and layers on lighter colors.	Waste materials such as old car and radio parts are pieced together to make sculptures, some of which are wearable.	Pieces of paper are carefully folded into the shapes of animals and objects.
What impact does the art make?	It promotes conservation by allowing people to connect with endangered animals.	It raises awareness of social issues affecting people locally.	It is giving scientists and engineers a new way to design machines.

LEVEL 4 Graphic Organizers

UNIT 4: RETHINKING TRANSPORT

Complete the concept map as you read *Green Air Travel*.

Suggested answers:



## LEVEL 4 Graphic Organizers

## UNIT 5: WORKING TOGETHER

Complete the summary diagram as you read *The Smart Swarm*.

Suggested answers:

## SMART SWARMS

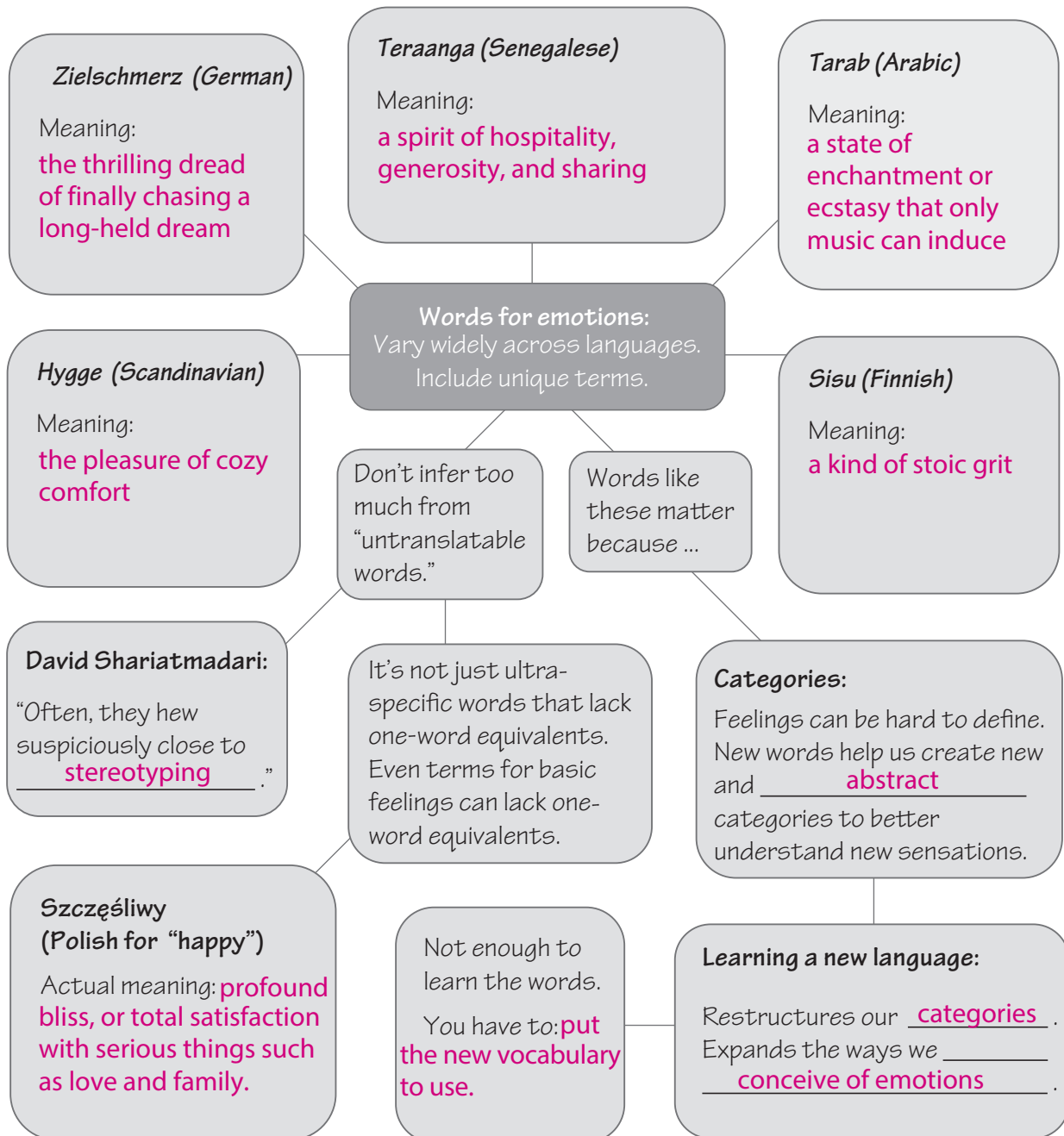
DEFINITION:	A group of individuals who respond to one another and to their environment in ways that give them the power, as a group, to cope with uncertainty, complexity, and change.
CRITERIA:	Members of smart swarms: <ul style="list-style-type: none"><li>- don't all talk to each.</li><li>- act on local information.</li><li>- are anonymous.</li></ul>
FUTURE ROBOTICS APPLICATIONS:	First responders (Swarmanoids): <ul style="list-style-type: none"><li>- Respond to fires and other disasters.</li></ul> Military (Centibots): <ul style="list-style-type: none"><li>- Flush out terrorists/locate prisoners/find victims/examine chemical-spills/watch for intruders along borders, etc.</li></ul>
WHY ANIMALS SWARM:	Detect predators/find food/locate a mate/follow migration routes, etc.
CURRENT ONLINE APPLICATIONS:	Google search engine: uses the collective intelligence of the Web to determine a page's importance.  Wikipedia online encyclopedia: allows anybody to contribute or edit entries. Possible for huge numbers of people to think together in ways not possible a few decades ago.

## LEVEL 4 Graphic Organizers

## UNIT 6: WHY LANGUAGE MATTERS

Complete the concept map as you read *Is Joy the Same in Every Language?*

Suggested answers:



## LEVEL 4 Graphic Organizers

## UNIT 7: RESOURCES AND DEVELOPMENT

Complete the notes as you read *The Shape of Africa*.

Suggested answers:

CONTINENT:	Africa
GEOGRAPHICAL DESCRIPTION:	<p>The African continent resembles a bulging sandwich.</p> <p>It is the only continent that spans both the north and south temperate zones:</p> <p>It has a thick tropical core lying between one thin temperate zone in the north and another in the south.</p>
PROBLEMS:	<p>AGRICULTURE:</p> <p>Plants: Crops cannot spread easily into much of Africa because of its north-south orientation. They would have to adapt to changing climates to spread.</p> <p>Animals: Africa's wild animals cannot be domesticated easily. Many evolved alongside humans and therefore developed a healthy fear of us.</p> <p>DISEASES:</p> <p>Humans have lived alongside animals in Africa for a very long time, giving microbes there much more time to adapt to us.</p> <p>Africa has the animals most closely related to us: the great apes. Their microbes require the least adaptation to jump species to us.</p> <p>ACCESS TO WATERWAYS:</p> <p>Nearly a third of African countries are landlocked. The Nile is the only African river navigable from the ocean for long distances inland. It is therefore difficult to transport goods cheaply in much of Africa.</p>
SOLUTIONS:	<p>Manage its resources carefully (e.g., rivers, animals, forests).</p> <p>Invest in public health measures. Get businesses to fund these measures, too.</p> <p>Deal with the corruption that permeates its government and institutions.</p> <p>Use technology to take advantage of globalization.</p> <p>Make use of Africa's large English-speaking population to attract service jobs.</p>

## LEVEL 4 Graphic Organizers

## UNIT 8: LIVING LONGER

Complete the notes after you have read *Beyond 100*.

Suggested answers:

## CALABRIA AND LONGEVITY

LOCATION: What is the area like?	Mainland Italy's southernmost region (probably warm). Rural: Close to mountain ranges. Has orange trees and olive groves growing.
DIET: How do the centenarians usually eat?  What does science say about eating sparingly?	They don't eat much. They eat mostly fruit and vegetables. They don't eat much meat.  According to science, the link between eating sparingly and living longer is not as strong as once thought. Research done on mice and primates supports this.
RESEARCH: Why is Calabria a good place to study longevity?	There are many nonagenarians and centenarians there. Calabria has detailed records of people dating back to 1866 (birth, marriage, and death certificates, etc.). Researchers can use these records to determine how much genes affect longevity compared to environmental factors.
GENETICS: How do genes contribute to longevity?	Genetic factors contribute to longevity in men more than women (women often live longer because of lifestyle factors, e.g., diet, medical care).  Some people possess a particular allele of a gene: Gives people a taste for bitter foods that promote cellular health. Allows the intestine to extract nutrients more efficiently from food.  Some people possess a gene for an uncoupling protein: It plays a central role in metabolism (how we consume energy and regulate body heat), which affects the rate of aging.  Genetics can increase longevity by affecting our responses to stress, our metabolization of nutrients, and our metabolisms in general.
CHANCE: How did luck factor in Salvatore Caruso's life?	He broke his leg and couldn't join the rest of his army unit in Russia during WWII.  Nobody from his unit made it back from Russia alive.

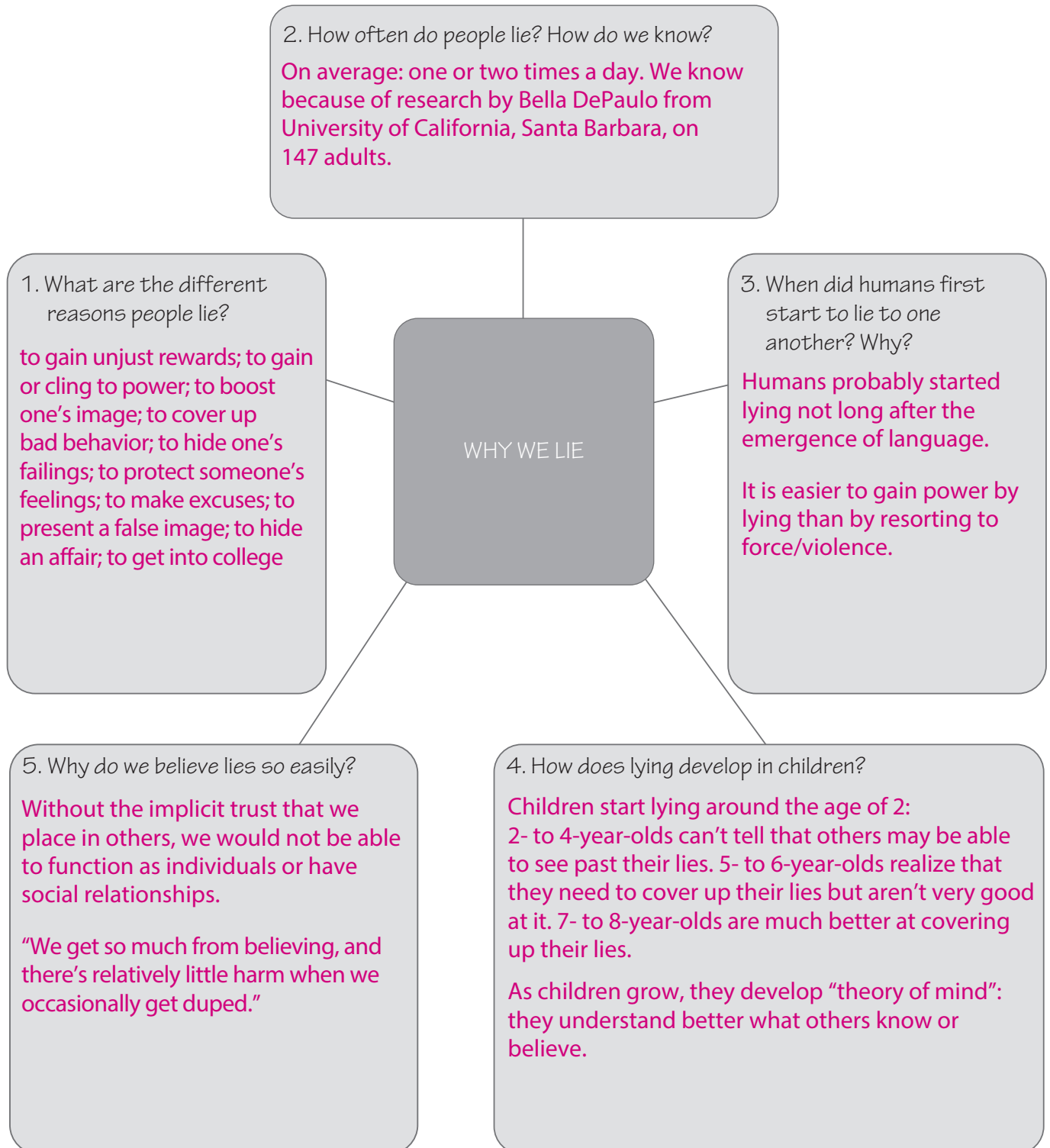


LEVEL 4 Graphic Organizers

## UNIT 9: TRUTH AND DECEPTION

Make notes in the outline as you read *Why We Lie*.

Suggested answers:



LEVEL 4 Graphic Organizers

UNIT 10: CHANGING THE PLANET

Complete the outline as you read *The Human Age*.

Suggested answers:

