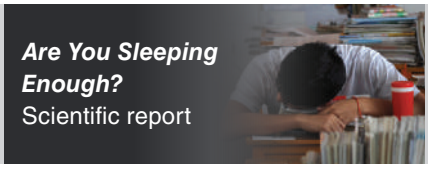
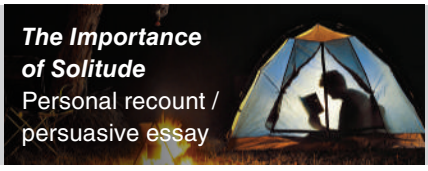
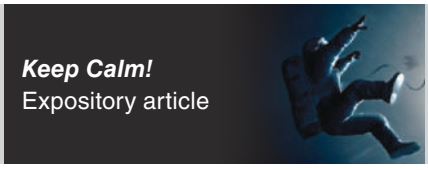
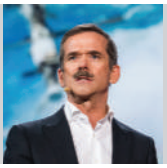
SCOPE AND SEQUENCE

Unit/Theme	Lesson A Reading	Reading Skills	Critical Thinking
1 **HIDDEN MIRACLES** *Life Science*	 ***Viewing Nature's Beauty Through a New Lens*** Interview	• Understanding reasons • Understanding key details • Paraphrasing ideas	• Interpreting a statement • Reflecting on own experience
2 **SLEEP MATTERS** *Health Science*	 ***Are You Sleeping Enough?*** Scientific report	• Identifying reasons and effects • Understanding statistics • Understanding infographics	• Analyzing a writer's claims • Evaluating an argument
3 **CYBORG TECH** *Engineering / Technology*	 ***We Are Cyborgs*** Expository article	• Understanding main ideas and key details	• Analyzing an argument for evidence • Evaluating possible problems
4 **HAPPY PLANET** *Economics / Statistics*	 ***The Road to Happiness?*** Argumentative article	• Linking ideas using a summary chart • Analyzing an argument • Understanding infographics	• Evaluating an argument • Questioning statements in a text
5 **CAREER PATHS** *Business / Design*	 ***My Year in the Arctic*** Personal blog	• Understanding sequence • Understanding reasons • Understanding figurative language	• Evaluating pros and cons • Interpreting a statement
6 **TEXT GENERATION** *Linguistics*	 ***The Death of Writing?*** Explanatory article	• Understanding key details • Making comparisons • Understanding contrastive language	• Interpreting meaning
7 **BARRIERS AND BRIDGES** *Sociology*	 ***Bringing the World Together*** Personal blog	• Understanding tone and purpose using a concept map	• Evaluating an argument using examples
8 **PERSONALITY TYPES** *Psychology*	 ***The Importance of Solitude*** Personal recount / persuasive essay	• Understanding sequence • Identifying different viewpoints • Understanding classifications	• Making inferences • Evaluating an argument using examples
9 **SMART THINKING** *Behavior / Life Science*	 ***Nature of Intelligence*** Scientific article	• Understanding key details • Inferring conclusions • Understanding reference	• Applying ideas to other contexts
10 **FACING FEAR** *Psychology / Exploration*	 ***Keep Calm!*** Expository article	• Linking ideas and examples • Creating a map of the text • Understanding a process	• Questioning statements in a text • Applying ideas to other contexts

Lesson B	TED Talks	Academic Skills	Critical Thinking	Project
	***Hidden Miracles of the Natural World*** Louie Schwartzberg	• Understanding main ideas and key details • Connecting ideas using a concept map • Making predictions	• Making predictions	• Researching for a presentation on biomimicry
	***How to Succeed? Get More Sleep*** Arianna Huffington	• Understanding main ideas and classifications • Understanding metaphors • Understanding a speaker's message	• Evaluating an argument • Synthesizing ideas from multiple sources	• Researching for a presentation about sleep
	***I Listen to Color*** Neil Harbisson	• Understanding key details • Understanding a process	• Reflecting on own viewpoint • Comparing similarities to other contexts	• Researching for a presentation on cyborg technology
	***The Happy Planet Index*** Nic Marks	• Identifying key details • Recognizing a speaker's message • Recognizing main ideas and examples	• Questioning survey results • Applying information to own context	• Designing a plan for community happiness
	***The Power of Time Off*** Stefan Sagmeister	• Understanding main ideas and key details • Making predictions • Understanding causes and effects	• Synthesizing information • Evaluating pros and cons • Applying ideas to own context	• Creating a time-off plan for employees
	***Txtng is Killing Language. JK!!!*** John McWhorter	• Understanding key details • Making predictions • Applying information to new contexts • Summarizing information	• Evaluating an argument • Applying ideas to own experience	• Presenting an analysis of how people use texting
	***The Danger of a Single Story*** Chimamanda Ngozi Adichie	• Understanding key details • Understanding a sequence of events • Understanding a process • Identifying main ideas	• Synthesizing ideas • Applying ideas to own context	• Critically evaluating an example of cultural stereotyping
	***The Power of Introverts*** Susan Cain	• Understanding key details • Understanding cause and effect • Understanding a speaker's message	• Reflecting on own experience • Applying ideas to other contexts	• Researching for a presentation on contributions to society
	***The Gentle Genius of Bonobos*** Susan Savage-Rumbaugh	• Understanding main ideas and key details • Understanding a speaker's message • Understanding sequence	• Reflecting on own experience	• Proposing and justifying a wildlife research project
	***What I Learned from Going Blind in Space*** Chris Hadfield	• Recognizing and understanding main ideas • Interpreting descriptions • Understanding a sequence of events	• Interpreting meaning	• Designing a 3-day course for tackling phobias

Unit 1

GOALS

IN THIS UNIT, YOU WILL:

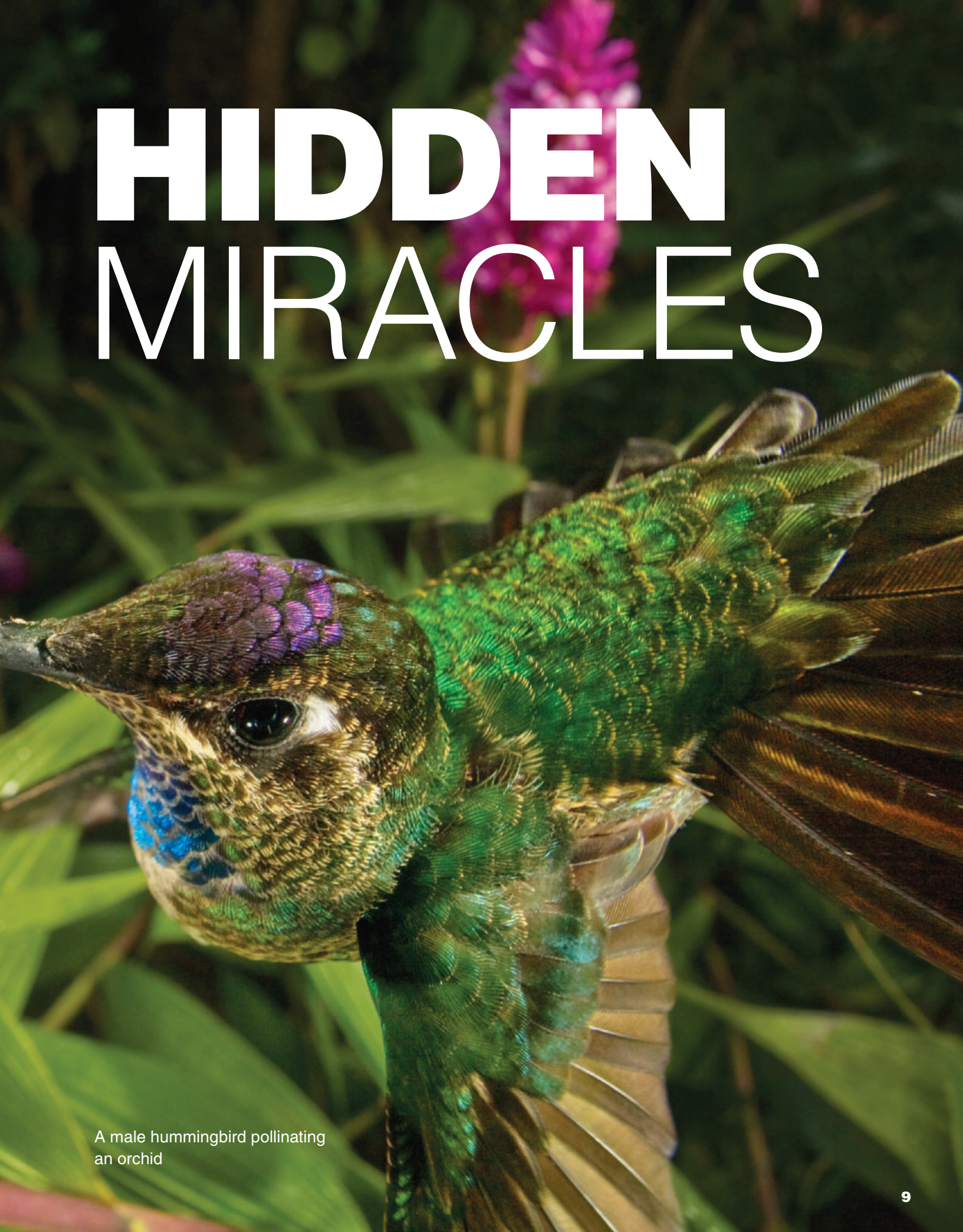
- Read about a person who captures amazing images of nature.
- Learn about a new way of viewing the world.
- Explore how the natural world has inspired the development of new technology and inventions.

THINK AND DISCUSS

1. What are some things in nature that we cannot see with our own eyes?

2. Binoculars and microscopes are tools that help us look at nature more closely. Can you think of other examples? Which ones have you used?

HIDDEN MIRACLES



A male hummingbird pollinating an orchid

Lesson A

PRE-READING

A. **Look at the photos on pages 10–13. What do you think each one shows? Read the captions to check your ideas.**

B. **Answer the following questions about the passage on pages 11–13.**

1. Read the introduction. Who is the passage about? What is his profession?

_____

_____

2. What kinds of things do you think time-lapse photography can show us?

_____

_____

3. Read the sentences in bold in the passage. List the topics you think the passage will cover. Share your ideas with a partner.

_____

_____

_____

_____

_____

4. Skim the entire passage. What kind of passage is this?

   a. An art book excerpt

   b. A science article

   c. An interview

Close-up of a caterpillar's mouth as seen under an electron microscope

Filmmaker Louie Schwartzberg has shot everything from TV commercials to documentaries, but he is best known for his time-lapse photography, a technique that captures images on film very slowly. When shown at regular speed, the viewer can see things the human eye cannot normally see. Schwartzberg's remarkable documentary—*Mysteries of the Unseen World*—**illustrates** his talent for capturing the wonders of nature using this technique.

VIEWING NATURE'S BEAUTY THROUGH A NEW LENS

National Geographic *spoke with Louie Schwartzberg about the* ***challenges*** *and rewards of his career in photography, the* ***issues*** *he feels most passionate about, and why he believes it's important that we all become more connected to nature.*

How did you become interested in nature photography and filmmaking?

1 I found my voice with photography as a student at UCLA [the University of California at Los Angeles]. We had anti-war protests going on right outside my classroom, so I picked up a camera and started to **document** that. And when I met my greatest teacher, then I fell in love with nature. He taught me everything about lighting, composition, color, and how to live a sustainable, creative life.

Can you explain a little more about your Moving Art project and what the mission is?

2 Basically, I've got a thousand hours of material that I've filmed over the years. The mission is to be able to share how cool nature is—there's amazing time-lapse, slow motion, and aerials. You may have heard of nature deficit disorder,

aerials: *n.* images that are taken from above, as from an airplane

anti-war protests: *n.* demonstrations that express opposition to war

where kids are suffering from the fact that they're not connected to nature, but I think what we need to do is engage them where they are. That's what I'm trying to do.

You've been shooting time-lapse 24/7 for over three decades. What have you been shooting?

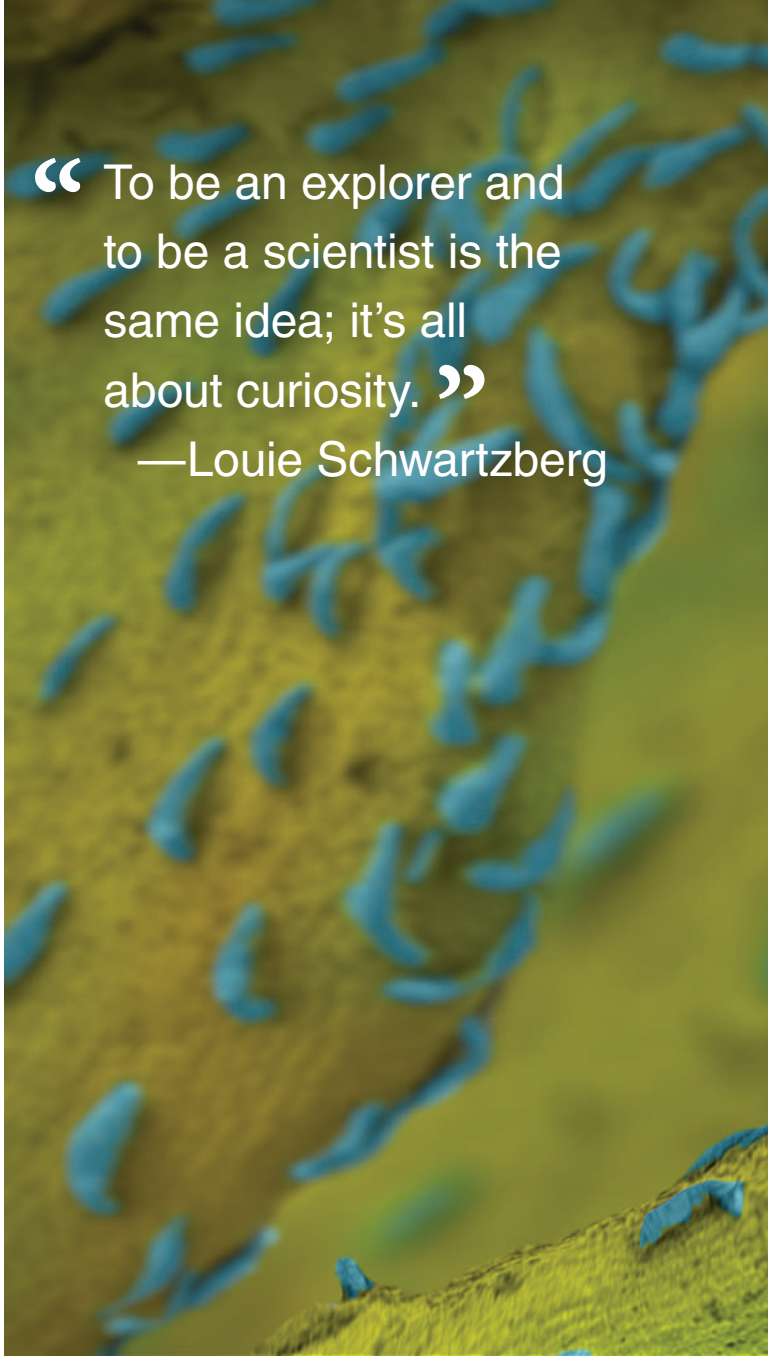
3 Flowers, **primarily**. They kind of seduce you with their beauty and you fall in love with them. That's why I made a film about pollination, which is so critical. A third of our food comes from pollinating plants. But to answer your question **specifically**, I've got two cameras going nonstop 24 hours a day, seven days a week, because time is precious and I don't want to waste a single second. I've squeezed 35 years of shooting into 12 hours of material.

What are some of the challenges that you deal with when you're time-lapse filmmaking?

4 The biggest ones, I think, are mosquitoes. They come out at sunset, at early dawn, and at twilight. . . . but besides the mosquitoes, when I'm on location, it's about survival. I've got to figure out food, water, transportation, and how to get back home when it gets dark. It's not just the technique, but I do it because I think time-lapse can **transform** your consciousness by helping you see things from a different point of view. That's when you change your perspective. And when you change your perspective, that's how you develop gratitude.

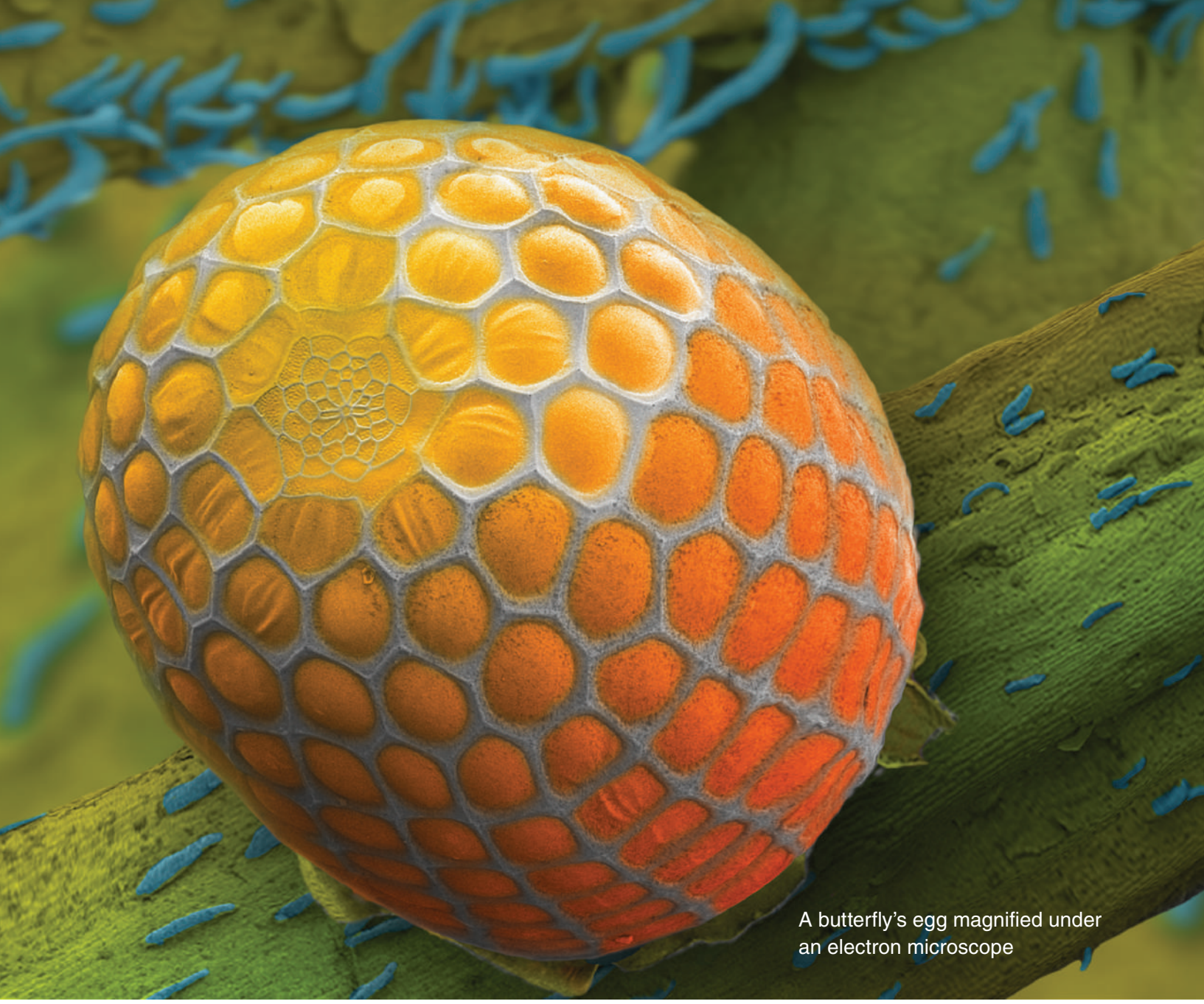
What's one of the most memorable experiences you've had in nature while doing your work?

5 I was recently in Panama shooting hummingbirds in slow motion. It's just amazing to see their world. They're very territorial with the way they kind of fight each other to get the flower. And nectar-feeding bats in the Sonoran Desert—I got this incredible shot of a baby bat breastfeeding on the mother bat as the mom is feeding on a flower in the desert. Most people don't realize the entire Sonoran Desert would not exist without these nectar-feeding bats.



What environmental issues mean the most to you right now?

6 I think [bee] colony collapse disorder would be at the top. I've heard scientists say it could be way more serious than climate change. And there's a quote **attributed to** Einstein that if the bees ever disappeared, man would only have four years left to live. It doesn't really matter whether it's true or whether Einstein said it or not. The healthiest food we need to eat—fruits, nuts, seeds, and vegetables—would disappear without pollinating plants. It's pretty serious.



A butterfly's egg magnified under an electron microscope

What would you say is one of the most surprising things you've learned in your career?

7 I keep getting the same things **reinforced** over and over. When I film things, I'm connecting with the universal rhythms of the universe, which is the deepest part of my soul. And it's this **constant** reminder that it's all connected. I also think we always have to be curious, and nature really inspires you to be an explorer [. . .]. To be an explorer and to be a scientist is the same idea; it's all about curiosity. And I think the same thing is true being a filmmaker or an artist. We have different rules, but we're both trying to share the wonders of nature and the universe with people.

[bee] colony collapse disorder: *n.* a mysterious condition that is killing bees and weakening their colonies

gratitude: *n.* thankfulness, appreciation

pollination: *n.* the action of transferring pollen to the stigma of a plant so that it can reproduce

shooting: *v.* taking photographs (of)

twilight: *n.* the period between sunset and darkness

GETTING THE MAIN IDEAS

What main points does Schwartzberg make in this interview? Check (✓) three ideas he mentions.

1. ____ It's important for young people to feel more engaged with nature.
2. ____ More investment is needed to improve time-lapse filmmaking technology.
3. ____ Time-lapse can help people see the world from a different perspective.
4. ____ People should always be curious about the world around them.
5. ____ Photography is important for anti-war movements around the world.
6. ____ Time-lapse has helped make people more aware of climate change.

▲ A close-up image of a flea seen under an electron microscope

UNDERSTANDING REASONS

Expressions such as *that's why, because*, and *so* can help a reader understand the connections between ideas and the reasons for them. However, sometimes the reasons behind an idea are implied and not clearly stated; they are not connected to ideas with specific words or phrases.

Match the reasons (a–f) with the ideas below. Use the information in the passage to help you. Two reasons are extra.

a. He was able to get a unique photograph of a baby bat in mid-flight.

b. A lot of our most important food would disappear if there were no bees.

c. Pollinating plants are beautiful, and they are important for our survival.

d. There's so little time and so many things to capture on film.

e. He wants to use time-lapse photography to change people's perspective.

f. Some protests were going on outside his classroom at UCLA.

Idea	Reason
Schwartzberg specializes in photographing flowers.	
Schwartzberg has cameras going continuously, 24 hours a day, seven days a week.	
Schwartzberg is willing to deal with many challenges to capture his images.	
Schwartzberg believes colony collapse is the most important environmental issue.	

UNDERSTANDING KEY DETAILS

A. **What are some key details about Louie Schwartzberg's life and work? Complete the concept map with the information (a–f).**

a. creates films from an extremely large number of images

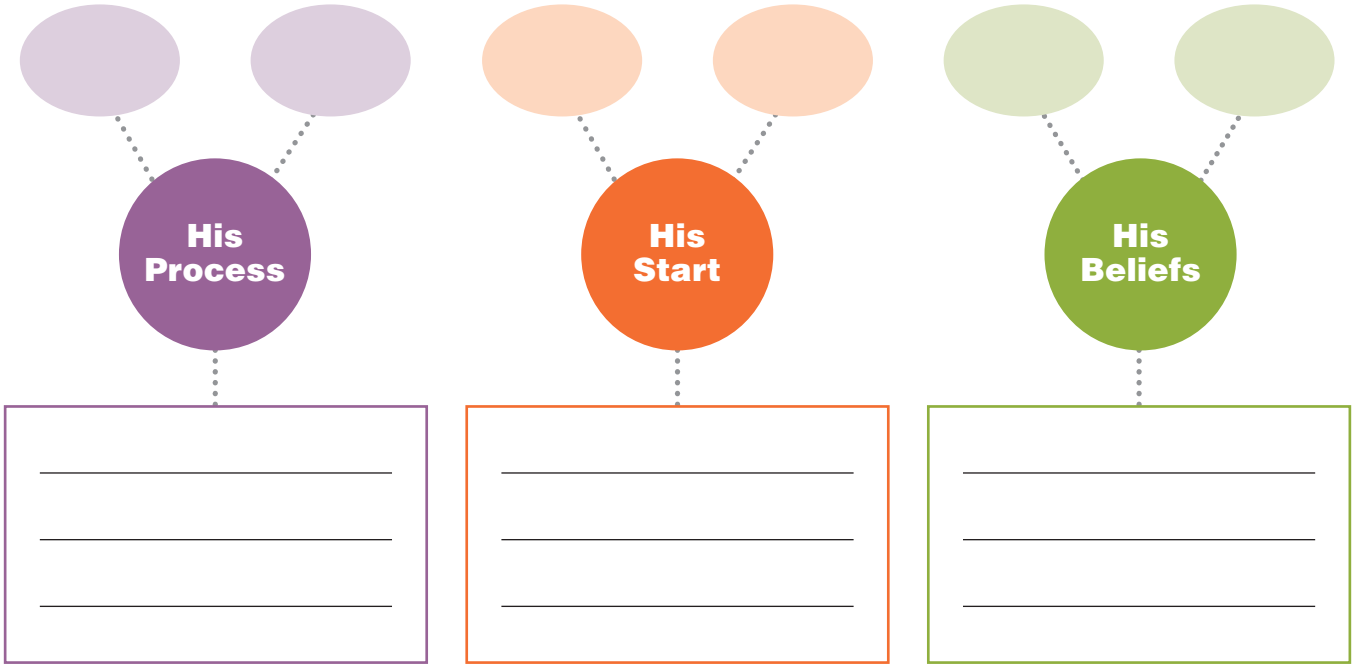
b. learned about photography from a university teacher

c. everything in nature is connected

d. was a student at UCLA

e. time-lapse is about changing the way people see the world

f. is continuously shooting



B. **Add one more detail about Schwartzberg's life and work to each category in the concept map.**

PARAPHRASING

Find these sentences in the passage on pages 11–13. Use the context (the sentences before and after) to understand the meaning. Then paraphrase each sentence by rewriting it in your own words.

1. I've squeezed 35 years of shooting into 12 hours of material.

_____

2. . . . when you change your perspective, that's how you develop gratitude.

_____

3. I keep getting the same things reinforced over and over.

_____

BUILDING VOCABULARY

A. Complete the paragraph with the words below.

challenges **illustrates** **primarily** **specifically**

Finding the right light is one of the main _____ (1) of photographing nature. Experts suggest taking photographs _____ (2) when the weather is overcast. If you shoot mainly when there are clouds in the sky, your images will have more intense colors. The photo below of a rice plantation in Indonesia _____ (3) this idea. The photographer shot the picture on a cloudy day, which intensified the deep green of the rice terraces. Another problem nature photographers sometimes have is finding the right background. Experts suggest looking for subjects in environments without any manmade structures that will interfere with the image; _____ (4), they suggest finding locations where there are no fences, utility poles, or buildings.

Jatiluwih rice terraces in Bali, Indonesia
photographed by Jim Richardson

B. Choose the correct definition for each of the bold words.

1. The quotation "Look deep into nature, and then you will understand everything better" is **attributed to** Albert Einstein.
   - **a.** believed to be from
   - **b.** a way to describe

2. Climate change is one of the most important environmental **issues** that we face today.
   - **a.** topics
   - **b.** documents

3. Extreme weather events present a **constant** reminder that global warming is a serious problem.
   - **a.** conflicting
   - **b.** continuous

4. You can **reinforce** an appreciation of nature by taking city children on wilderness field trips.
   - **a.** strengthen
   - **b.** introduce

5. Spending a few days in the wilderness can completely **transform** the way some children see the world.
   - **a.** confuse
   - **b.** change

6. Some photographers travel the world **documenting** the lives of people in war-torn countries.
   - **a.** providing evidence for
   - **b.** making a record of

GETTING MEANING FROM CONTEXT

Note answers to the questions and discuss your ideas with a partner.

1. What do you think Louie Schwartzberg means when he says, "I found my voice with photography"?

   _____

2. What does Schwartzberg mean by a "nature deficit disorder"?

   _____

CRITICAL THINKING

1. Interpreting. Look again at Schwartzberg's answer to the final question in the interview. How does he compare explorers and scientists with filmmakers and artists? What do you think he means by "different rules"? Explain your ideas to a partner.
2. Reflecting. Have you seen any images—in photographs or on film—that have changed your thinking or the way that you view the world? If so, describe the images and explain how they changed your perspective.

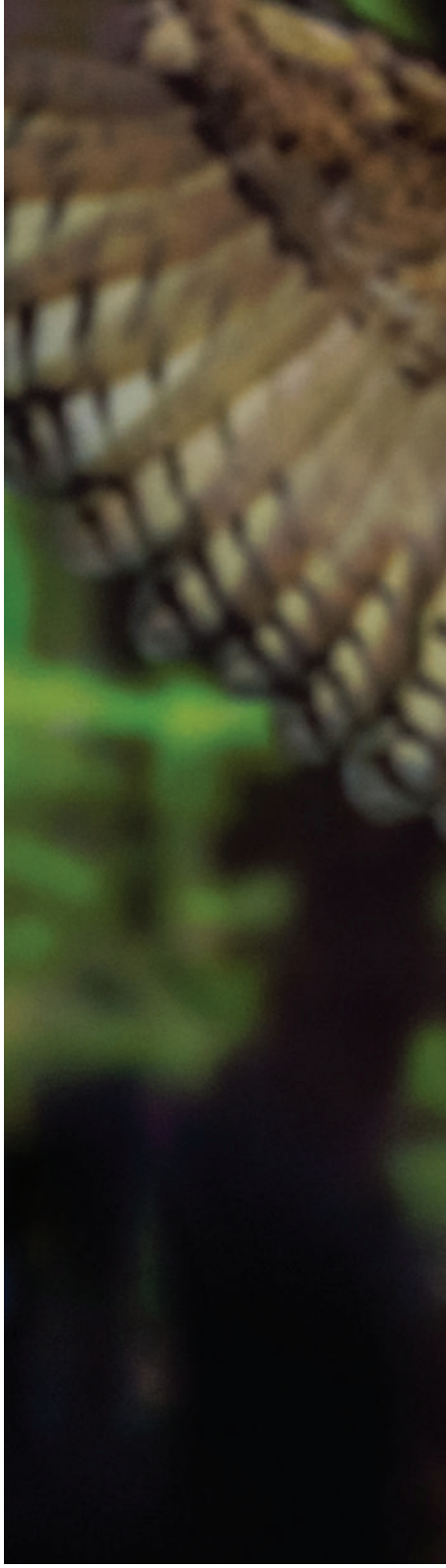
EXPLORE MORE

See more of Louie Schwartzberg's images of the natural world by watching his TED Talk "The hidden beauty of pollination." What does it reveal about the relationship between plants and insects? Share your information with the class.

Lesson B

TEDTALKS

HIDDEN MIRACLES OF THE NATURAL WORLD



LOUIE SCHWARTZBERG Filmmaker, TED speaker

Like many of us, Louie Schwartzberg has always loved looking at beautiful flowers. In doing so, he has realized something important about them: They help us understand that everything is connected in the natural world.

After graduating from college, Schwartzberg decided to live a simple life in the countryside. He had no phone and no TV. With few distractions, he had all the time in the world to follow his passion: filming flowers using time-lapse photography. His work has helped him understand the connections between different plants and animals—including humans. He believes that our connection to nature can bring great happiness. He believes it can help us live in the moment and be grateful for what we have.

Today, Schwartzberg hopes that his work will not only help people find happiness in the beauty of nature, but also inspire them to protect and sustain the planet.

sustain: *v.* to keep in existence by providing support, strength, or necessities

Schwartzberg's **idea worth spreading** is that technology enables us to see things differently. It can change our beliefs about nature and our place in it.

In this lesson, you are going to watch Schwartzberg's talk. Use the information on page 18 to answer each question.

1. How do you think Schwartzberg's lifestyle choices after college contributed to his later work?

2. What two effects does Schwartzberg hope his work will have?

PART 1

A NEW WAY OF SEEING

PREVIEWING

A. Read the excerpt below from Schwartzberg's talk. What do you think you will see in *Mysteries of the Unseen World*?

_____

_____

B. What words do you think are missing in the excerpt? Check your ideas as you watch (▶) the first segment of the TED Talk.

"What is the intersection between technology, art, and science? Curiosity and wonder, because it drives us to explore, because we're _____ (1) by things we can't see. And I love to use film to take us on a _____ (2) through portals of time and space, to make the invisible visible, because what that does, it _____ (3) our horizons, it transforms our perception, it _____ (4) our minds, and it touches our heart. So here are some scenes from my 3D IMAX film, *Mysteries of the Unseen World*."

intersection: *n.* a point where two or more things or ideas connect

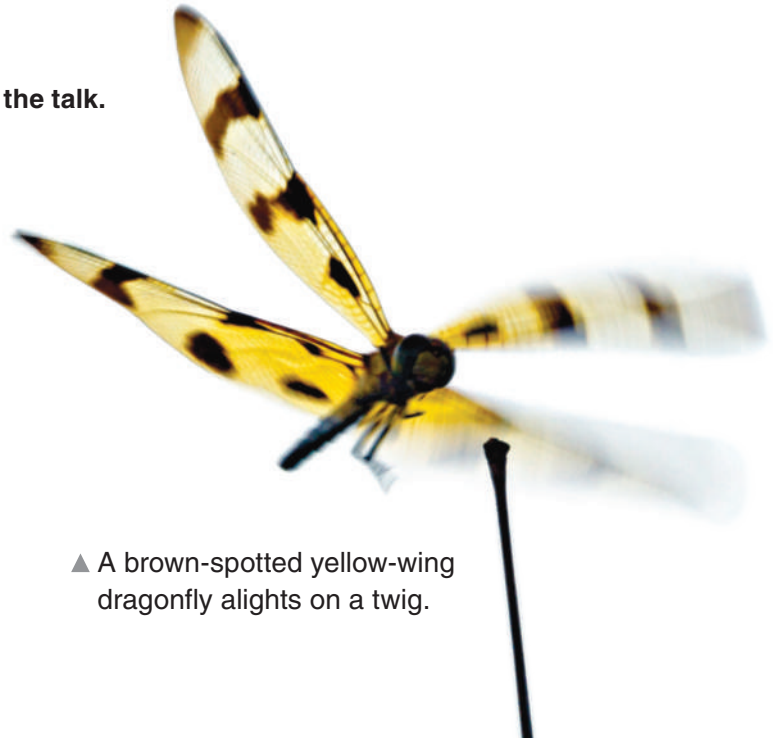
portals: *n.* entrances, doors

UNDERSTANDING MAIN IDEAS

Check (✓) the two main ideas of this part of the talk.

Time-lapse can show us things that . . .

1. ____ are very old.
2. ____ move or grow very slowly.
3. ____ act in an unusual way.
4. ____ are extremely fast.
5. ____ occur very rarely.

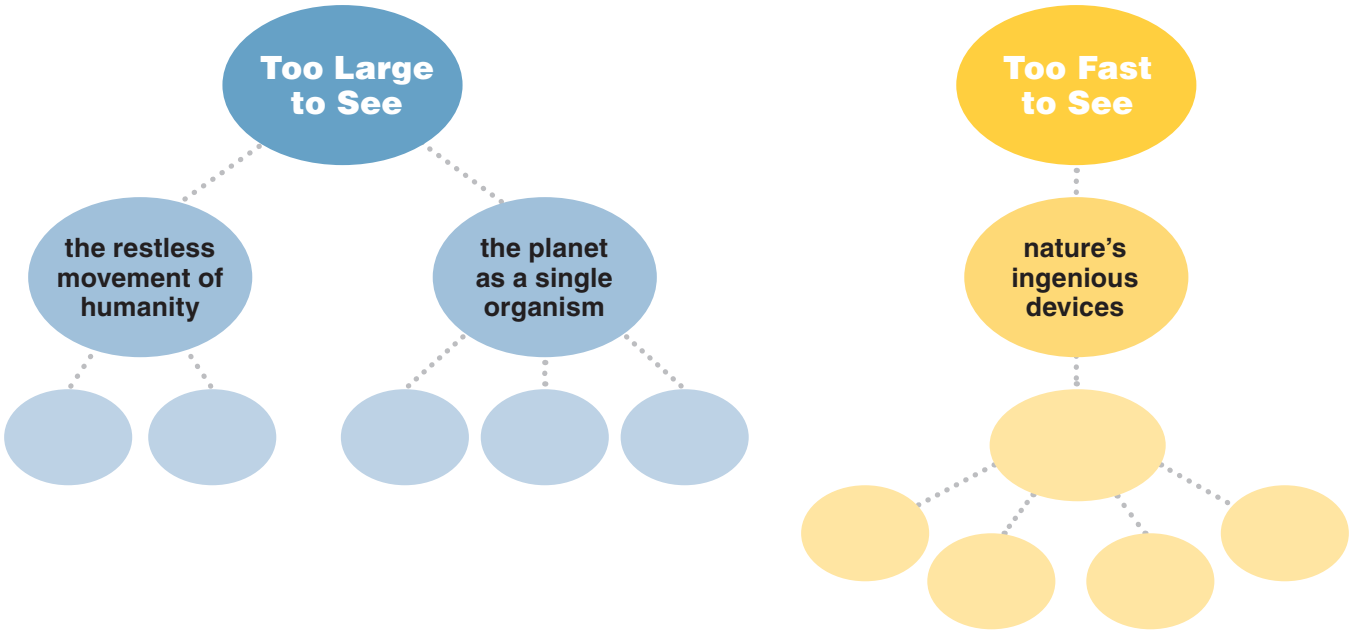


▲ A brown-spotted yellow-wing dragonfly alights on a twig.

CONNECTING MAIN IDEAS AND DETAILS

A. **Complete the mind map. Match the main ideas from Schwartzberg's talk with the examples.**

a. air flow
b. insect movement
c. hovering
d. ships at sea
e. clouds
f. flying backwards
g. four wings in different directions
h. air traffic data
i. aurora borealis
j. lightning



B. **Now use the mind map and information from this part of the talk to answer these questions.**

1. Why does Schwartzberg say the dragonfly is the greatest flier in nature?

_____

2. According to Schwartzberg, what kinds of devices might we be able to create as a result of seeing insect movement close up?

_____

CRITICAL THINKING

Predicting. What else do you think time-lapse photography might allow us to see? Would it be mainly to capture the beauty of nature, or do you think there could be some practical application?

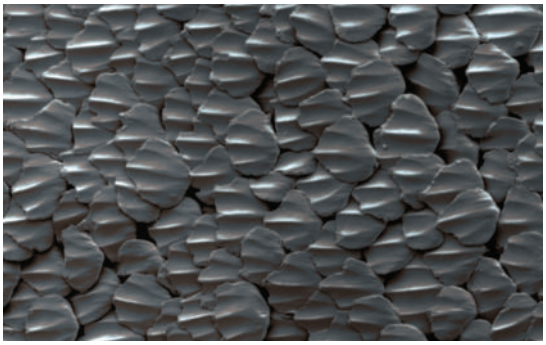
PART 2

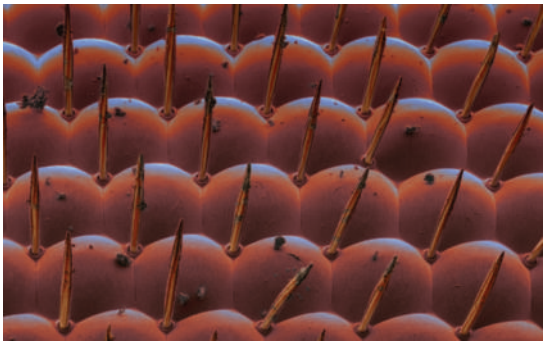
STRANGE NEW WORLDS

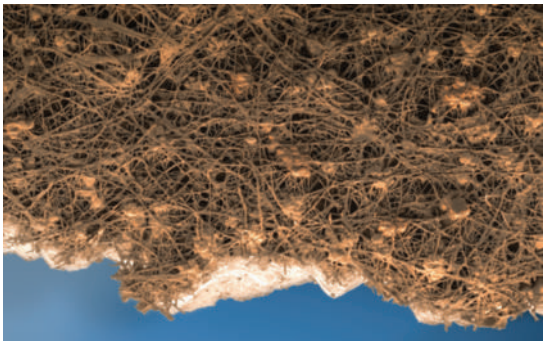
PREDICTING

What do you think these images show? Work with a partner to match each picture with a caption. Check your ideas as you watch (▶) the next part of Schwartzberg's talk.

a. a snail's tongue **b.** a fruit fly's eye **c.** shark skin **d.** an eggshell

1. ____ 

2. ____ 

3. ____ 

4. ____ 

UNDERSTANDING KEY DETAILS

Use information from Schwartzberg's TED Talk to answer these questions.

1. What is special about spider silk?

It is _____ than human hair but _____ than steel.

2. What might nano devices be able to do someday?

Patrol our bodies for _____, _____ arteries, and _____ DNA.

EXPLORE MORE

Find out more about Louie Schwartzberg's film *Mysteries of the Unseen World* at movies.nationalgeographic.com. Share your information with the class.

Project

An Olympic swimmer wearing a swimsuit made of fabric based on shark skin

A. Work with a partner. You are going to find out about how something in nature has inspired a particular technology or invention.

1. Go to TED.com. Watch some of the following TED Talks to get ideas for nature-inspired inventions:
   - Janine Benyus, "Biomimicry in action"
   - Hamish Jolly, "A shark-deterrent wetsuit"
   - Michael Pawlyn, "Using nature's genius in architecture"
   - Cheryl Hayashi, "The magnificence of spider silk"
   - Markus Fischer, "A robot that flies like a bird"

2. With your partner, choose one of the technologies or inventions in the TED Talks you saw, and answer these questions about it.
   - What is the invention or technology?
   - What thing (animal, plant, etc.) in nature inspired the invention? Describe the properties that seem particularly useful or interesting.
   - How does the invention or technology work?
   - What are its applications?

3. Use your information to create a two-minute presentation. You can use drawings, photos, and video to explain your information.

B. Work with two other pairs.

- Give your presentations.
- As you listen, take notes.
- At the end, review your notes.
- Discuss: Which invention inspired by nature is the most interesting to you? Why?

EXPLORE MORE

Learn more about how nature has inspired new inventions and technologies at ngm.nationalgeographic.com/geopedia/Biomimetics. Share your information with the class.