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SPACE

The Vera Rubin Observatory

In the mountains of northern Chile, a brand-new telescope is about to change the way we see the universe. The Vera C. Rubin **Observatory**, perched on Cerro Pachón, will soon begin its mission of scanning the entire southern sky every few nights. Scientists have dreamed of this project for decades, and now it is nearly ready to start collecting data that could transform astronomy.

The observatory was first imagined in the 1990s by astronomer Tony Tyson. With help from U.S. institutions like the National Science Foundation and the Department of Energy, along with private donors including Bill Gates and Charles Simonyi, the facility slowly came to life.

It was named after Vera Rubin, the astronomer who provided some of the best evidence for the existence of dark matter back in the 1970s. She discovered that galaxies were rotating in a way that suggested some invisible matter was holding them together.

What makes the Rubin Observatory different from other

telescopes is its enormous camera and unusual design. The camera is the largest digital camera ever built, weighing about 3000 kilograms and fitted with 189 sensors. Each image it takes is so large that it contains more detail than 260 smartphone cameras combined. The giant mirrors, including a unique primary and **tertiary** mirror made from the same piece of glass, make sure the images stay sharp across a huge field of view. With this setup, the telescope will be able to capture an area of sky as wide as 45 full moons at once.

The purpose of the Rubin Observatory is to study both the slow and fast changes happening in the universe. Over its planned 10-year survey, it will create a map of about 20 billion galaxies and 20 billion stars, giving scientists an unmatched view of how the universe is structured. It will also track objects closer to home, such as asteroids and comets, and maybe even help locate a hidden ninth planet in our solar system. At the same time, it will catch quick, explosive events like supernovas, black



holes feeding on stars, and gamma-ray bursts. ★



DID YOU KNOW

The Vera C. Rubin Observatory features the world's largest digital camera.

To view videos, go to:
<http://resources.dynamic-classroom.ca/books/ibts>

Video



WORD POWER

OBSERVATORY: A building or place equipped for observing the sky and studying space

TERTIARY: Third in order, rank, or importance

SPACE**The Vera Rubin Observatory**

1. When was this observatory first imagined?

2. Who was the observatory named after?

3. What makes the Rubin Observatory different from other telescopes?

4. What is the purpose of the Rubin Observatory?

5. What is the most exciting part of the Rubin Observatory?

CRITICAL THINKING

1. Why is the Rubin Observatory important for studying space?

2. How could sharing its data with everyone change science?

INNOVATION

Pickleballs Help Cut Vehicle Drag

Sometimes, a good idea comes from the most unexpected place. For mechanical engineer Anchal Sareen, a pickleball was more than just a sports ball. It inspired a new way to make vehicles move more easily through air and water. This new idea could help cars, planes, submarines, and underwater drones use less energy and go faster.

Drag is a force that acts against moving objects, like wind pushing back on a car. It makes vehicles work harder and use more fuel or power. Engineers have tried many ways to reduce drag. One common trick is to make surfaces smooth and sleek. However, there is another way that is based on the **dimples** on sport balls like golf balls or pickleballs.

The team led by Sareen covered a pickleball with a balloon to create a surface with tiny dimples that can change depth by pumping air in or out. Unlike a golf ball's fixed dimples, these adjustable dimples can be made deeper or shallower when needed. This smart surface helps reduce drag by almost half

compared to a smooth, dimple-free surface.

To test the idea, the researchers 3-D printed ball-shaped models and placed them in wind tunnels. They controlled the dimple depth using a **vacuum pump** and found that even a small change made a big difference in slowing down drag. However, this technology does more than just reduce drag. By changing the dimples on one side of the ball, the surface can push the vehicle sideways or upward. This means vehicles could be steered in new ways without extra parts like fins or rudders.

This technology could help make airplanes fly more smoothly, help underwater robots explore the ocean more efficiently, and even save fuel by reducing resistance. The research team is still refining the design to create skins that quickly respond to changing air or water conditions. One day, this smart dimpled skin could make vehicles lighter, faster, and easier to control.

The inspiration came from a simple thing: a pickleball's dimples. This shows that



sometimes innovation starts with everyday objects. By learning from nature and sports, scientists and engineers find new ways to solve old problems. If this dimple technology becomes common, travelling by car, air, or sea could become cleaner and more efficient for everyone. ★



DID YOU KNOW

Pickleball was invented in 1965 by three friends on Bainbridge Island, Washington, using a mix of badminton and ping-pong paddles.

To view videos, go to:
<http://resources.dynamic-classroom.ca/books/ibts>

Video



WORD POWER

DRAG: A force that slows down objects moving through air or water by pushing against them, like wind pushing back on a car

DIMPLE: A small hollow or indentation on the surface of something

VACUUM PUMP: A device that removes air or gas from a space to create a vacuum

INNOVATION

Pickleballs Help Cut Vehicle Drag

1. What is drag?

2. What did Anchal Sareen’s team do with a pickleball? What does it do?

3. What experiment did the researchers conduct?

4. Besides reducing drag, what else does this technology do?

5. How could this technology be used?

CRITICAL THINKING

1. Why might reducing drag be important for saving energy and protecting the environment?

2. What problems could happen if this technology does not work as planned?

Forces of Flight

There are four forces that affect things that fly.

1. Weight is the force of gravity. It acts in a downward direction.
2. Lift is the force that acts at a right angle to the direction of motion through the air. Lift is created by differences in air pressure.
3. Thrust is the force that propels a flying machine in the direction of motion. Engines produce thrust.
4. Drag is the force that acts opposite to the direction of motion. Drag is caused by friction and differences in air pressure.

When an airplane flies, the wings are designed to provide enough lift to overcome the airplane's weight, while the engine provides enough thrust to overcome drag and move the airplane forward.

When an airplane is flying straight and level at a constant speed, the lift it produces balances its weight, and the thrust it produces balances its drag. However, this balance of forces changes as the airplane rises and descends, as it speeds up and slows down, and as it turns.

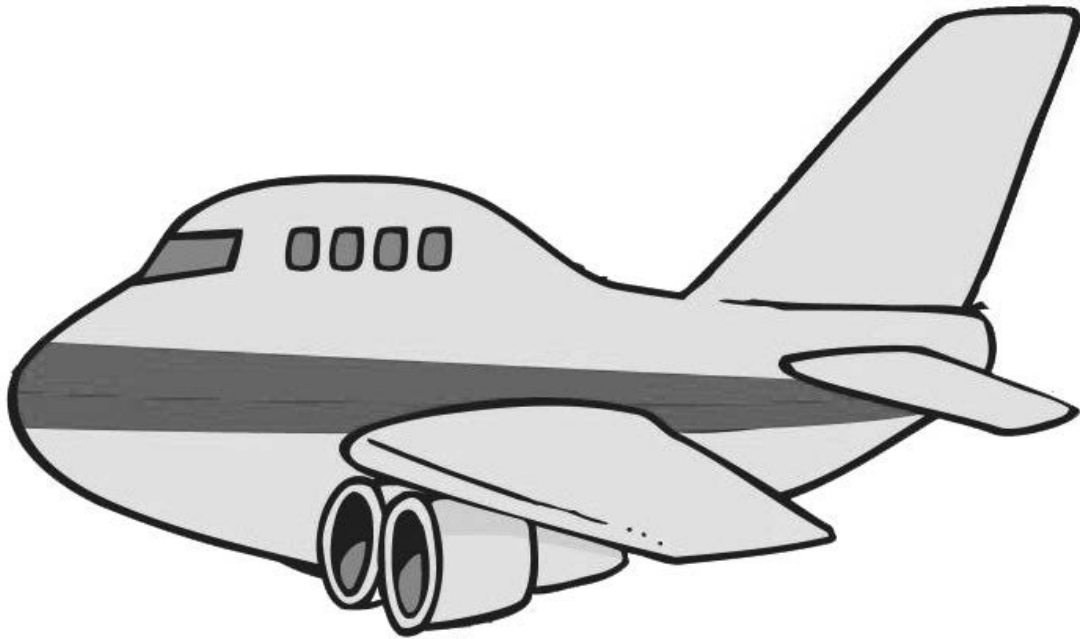
Increasing the weight of an aircraft affects the amount of lift needed. In turn, larger wings would provide more lift, but that would increase the amount of drag and therefore increase the amount of thrust needed. The forces of flight are connected, and a change in one affects the others.

What is a force?

A force is basically a push or a pull that causes an object to undergo a change in speed, a change in direction, or a change in shape. A force has both magnitude (size) and direction.



On the diagram below, use labels and arrows to show how each force (gravity, thrust, lift, and drag) acts on an airplane.



Answer the following multiple choice questions to show that you understand the forces of flight.

1. How does thrust help an airplane fly?
 - A. It lifts the airplane up.
 - B. It gives the airplane speed.
 - C. It slows the airplane down.
 - D. It pulls everything down.
2. What will happen to an airplane if drag is greater than thrust?
 - A. It will go faster.
 - B. It will go slower and higher.
 - C. It will go faster and higher.
 - D. It will go slower and be unable to fly.
3. What will happen to an airplane if lift is greater than gravity?
 - A. It will fly upward.
 - B. It will fly downward.
 - C. There will be no change.
 - D. It will not be able to fly.
4. Where does an airplane get its thrust?
 - A. Wings
 - B. Weight
 - C. Wheels
 - D. Engine or propeller

CHEMISTRY

Anti-Spice Compounds in Chili Peppers



Chili peppers are well known for their spicy heat, which many people enjoy adding to their food. The heat in chili peppers comes from special chemical compounds called capsaicinoids, with **capsaicin** being the most famous. Capsaicin is mostly found in the white, spongy part of the pepper called the placenta, where the seeds attach.

When people eat chili peppers, capsaicin binds to **receptors** in the mouth that sense heat and pain. This sends signals to the brain that cause the burning feeling we call “spice.” The level of heat in peppers is measured on the Scoville scale, where the hottest peppers score millions of heat units and sweet peppers have none.

Scientists recently discovered a surprising fact. Even though many chili peppers have the potential to be very spicy, they sometimes are not as hot as expected. This happens because of five newly found “anti-spice” compounds inside some peppers. These compounds act like natural coolers that reduce the peppers’

heat. They work by blocking or changing how the spicy molecules behave. This discovery helps explain why some peppers contain capsaicin but still don’t taste very hot.

These anti-spice compounds are part of an interesting chemical balance inside chili peppers. Capsaicin helps protect the pepper plants from animals that might eat them, since the heat is unpleasant for many creatures. However, the anti-spice compounds offer a gentler protection, possibly helping peppers survive better in different environments and attracting certain animals like birds that can spread their seeds without being hurt by the spice.

Knowing about these compounds could help farmers and food makers create new kinds of peppers with just the right amount of heat. For example, people who want some spice but not too much could enjoy milder peppers that still taste flavourful.

In the future, this new understanding of pepper chemistry might lead to better peppers for cooking and eating. It also teaches

us that nature uses clever chemistry to balance protection and survival in plants. Even something as small as an anti-spice compound can make a big difference. Scientists see many possible uses for these anti-spice compounds beyond just understanding pepper heat. This discovery shows how studying everyday foods can lead to useful inventions in cooking and health. ★



DID YOU KNOW

Chili peppers have been around for over 7000 years and were first cultivated in Mexico.

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Video



07:12:20.01 HD

WORD POWER

CAPSAICIN: A chemical in chili peppers that makes them spicy and causes a burning feeling in your mouth

RECEPTOR: A tiny part in your body that detects signals, like heat or pain, and tells your brain about them

CHEMISTRY**Anti-Spice Compounds in Chili Peppers**

1. Where does the heat in chili peppers come from?

2. What happens when people eat chili peppers?

3. What did scientists recently discover?

4. How do the capsaicin and anti-spice compounds work together to protect the pepper plants?

5. How might these compounds help farmers and food makers?

CRITICAL THINKING

1. How could understanding “anti-spice” compounds help people who don’t like spicy food?

2. What might happen if peppers didn’t have any “anti-spice” compounds at all?

ENVIRONMENT

The Fight Against Tan Spot



Wheat farmers face many challenges, but one stubborn disease called tan spot quietly damages crops every year and threatens harvests across Canada.

Tan spot is a disease that affects wheat plants and is caused by a fungus called *Pyrenophora tritici-repentis*. This fungus is not the most dangerous wheat disease, but it is very persistent and can cause serious damage to crops. Tan spot shows up on wheat leaves as small tan or brown spots that grow into diamond-shaped patches surrounded by yellow halos. These spots can join together to cover large parts of the leaf. The infected leaves often wither and die, which weakens the plant and makes it harder for the wheat to grow properly.

One problem caused by tan spot is that it damages the leaves where **photosynthesis** happens. Photosynthesis is the process plants use to turn sunlight into energy to grow. When tan spot damages the leaves, the plant can't make enough food, which slows down growth and reduces

the amount of wheat that farmers can harvest. If tan spot attacks the upper leaves and spreads to the wheat heads, it can also cause a problem called red smudge, which damages the grain, lowers its quality, and reduces its value.

Tan spot survives through the winter on leftover wheat stalks and straw in the fields. In the spring, it produces **spores** that are spread by wind and rain, infecting new wheat plants. The disease grows quickly during wet and humid weather. Farmers who plant wheat in fields with a lot of leftovers from previous crops are more likely to face tan spot problems.

Canadian researchers and farmers are trying to control tan spot through different methods. These include rotating crops. Farmers also use wheat varieties that are more resistant to tan spot and apply **fungicides**. Using proper farming techniques, like burying wheat residue in the soil and spacing rows of wheat plants farther apart, can help reduce the disease by lowering humidity that helps spores spread.

Even though tan spot is not the deadliest wheat disease, it can cause major losses over time if not managed well. Research continues to find better ways to fight this persistent threat, helping Canadian farmers protect their wheat crops and ensure good harvests for the future. ★



DID YOU KNOW

Farmers rotate crops to keep soil healthy, replenish nutrients, control pests and diseases, and reduce the need for chemical fertilizers and pesticides. This improves long-term crop yields.

To view videos, go to:
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Video



WORD POWER

PHOTOSYNTHESIS: The process in which plants use sunlight, water, and carbon dioxide to make their own food and grow

SPORES: Tiny cells produced by fungi or plants that can spread and grow into new plants or organisms

FUNGICIDE: A chemical that kills fungus

ENVIRONMENT**The Fight Against Tan Spot**

1. What is tan spot?

2. What does tan spot look like?

3. What is one problem caused by tan spot?

4. What happens to tan spot in winter and spring?

5. How are Canadian researchers and farmers trying to control tan spot?

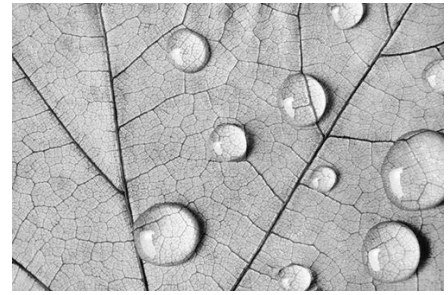
CRITICAL THINKING

1. Why is it important to control diseases like tan spot in wheat?

2. What might happen if tan spot spreads without any control?

BIG IDEAS

The Water Cycle



Water on Earth is always moving in a cycle that never ends. This cycle is called the water cycle.

The water cycle is how water travels from the ground to the sky and back again. The Sun plays a big role in this cycle because its heat causes water to change from liquid into a gas called water vapour. This happens mainly in oceans, lakes, and rivers. The process of water changing to vapour and rising into the air is called evaporation.

Plants help the water cycle too. They release water vapour through tiny holes in their leaves in a process called transpiration. Together, evaporation and transpiration move water into the atmosphere, where it cools down and changes back into tiny water droplets. This change from gas back to liquid is called condensation, and it forms clouds in the sky. When the clouds get full of water droplets, the water falls back to Earth as rain, snow, sleet, or hail. This is called precipitation.

Once water reaches the ground, it can flow over the

surface into lakes, rivers, and oceans, or soak into the soil to become **groundwater**. Plants and animals use this water to survive, and the cycle begins again.

Sometimes, the water cycle can be disrupted. Human activities, like cutting down forests or building cities, can change how water moves. For example, when trees are removed, less water is released into the air through transpiration. Pollution can also harm the water cycle by **contaminating** water sources. Climate change is another problem that affects the cycle by making weather patterns less predictable, causing more floods or droughts.

Despite these challenges, the water cycle continues to function, helping to support life on Earth. Understanding the water cycle helps us realize why it is important to take care of our environment and use water wisely.

The water cycle is easy to see in our everyday life. When it rains, water falls from clouds and lands in rivers or lakes, or on soil. Some of this water travels through streams back to oceans, where

it can evaporate again with the heat of the Sun. This constant movement of water supports all living things and keeps our environment healthy. Seeing how water changes forms and moves from one place to another helps us understand why water is so important to life on Earth. ★



DID YOU KNOW

The water you drink today might have been part of a dinosaur's world millions of years ago, because Earth's water has been recycling for over 4 billion years.

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Video



WORD POWER

GROUNDWATER: Water that is found under the ground in soil or rocks

CONTAMINATING: Making a substance or place dirty or no longer pure by adding a substance that is dangerous or carries disease

BIG IDEAS

The Water Cycle

1. What is the water cycle?

2. What role does the Sun play in the water cycle?

3. What happens after evaporation and transpiration move water into the atmosphere?

4. What happens once water reaches the ground?

5. How can the water cycle be disrupted?

CRITICAL THINKING

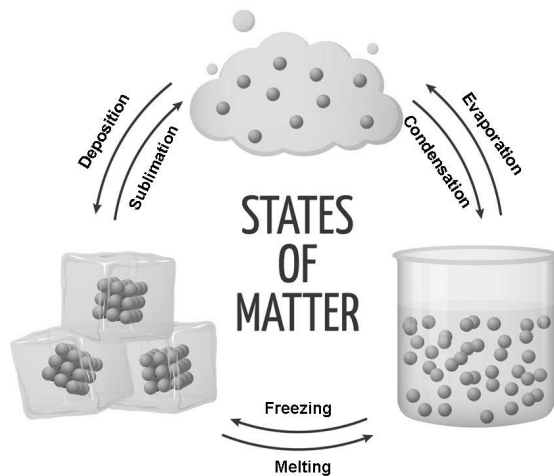
1. What could happen if pollution changes the water cycle?

2. Why is the water cycle important for life on Earth?

States of Water

Water is found in three common states: solid (ice), liquid (water), and gas (water vapour).

Below is a diagram that shows the processes that change water from one state to another.



Condensation: The process by which water vapour changes into liquid

Deposition: The process by which a gas turns into a solid, without becoming a liquid first

Evaporation: The process of liquid water changing into water vapor

Freezing: The process by which liquid water becomes ice

Melting: The process by which ice becomes liquid water

Sublimation: The process by which ice changes directly into water vapour, without becoming a liquid first

Match each word with the correct definition.

Condensation

The process by which liquid water becomes ice

Deposition

The process by which ice changes directly into water vapour, without becoming a liquid first

Evaporation

The process of water changing into water vapor

Freezing

The process by which ice becomes liquid water

Melting

The process by which water vapour changes into liquid

Sublimation

The process by which a gas turns into a solid, without becoming a liquid first

Science News Quiz

THE VERA RUBIN OBSERVATORY

1. The observatory is named after Vera Rubin, the astronomer who provided some of the best evidence for the existence of _____ back in the 1970s.
2. The purpose of the Rubin Observatory is to study both the slow and fast changes happening in the universe.
True False

PICKLEBALLS HELP CUT VEHICLE DRAG

1. Drag makes vehicles work _____ and use more fuel or power.
2. The researchers controlled the dimple depth using a vacuum pump and found that even big changes made only a little bit of difference in slowing down drag.
True False

ANTI-SPICE COMPOUNDS IN CHILI PEPPERS

1. When people eat chili peppers, capsaicin binds to receptors in the mouth that sense what?
A. Moisture B. Heat and pain C. Heat D. Touch
2. These anti-spice compounds are part of an interesting chemical _____ inside chili peppers.

THE FIGHT AGAINST TAN SPOT

1. What causes tan spot?
A. A bacteria B. A virus C. A fungus D. A parasite
2. In the spring, tan spot produces _____ that are spread by wind and rain, infecting new wheat plants.

THE WATER CYCLE

1. The _____ plays a big role in this cycle because its heat causes water to change from liquid into a gas called water vapour.
2. What is it called when the clouds get full of water droplets and the water falls back to Earth?
A. Precipitation B. Condensation C. Evaporation D. Transpiration

Science News Answer Key

The Vera Rubin Observatory

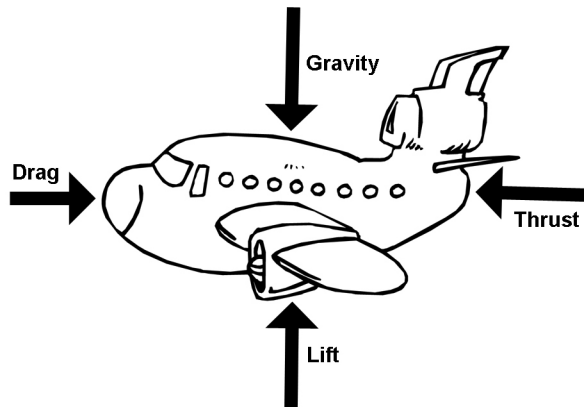
- 1. When was this observatory first imagined?**
The observatory was first imagined in the 1990s by astronomer Tony Tyson.
- 2. Who was the observatory named after?**
It was named after Vera Rubin, the astronomer who provided some of the best evidence for the existence of dark matter back in the 1970s. She discovered that galaxies were rotating in a way that suggested some invisible matter was holding them together.
- 3. What makes the Rubin Observatory different from other telescopes?**
What makes the Rubin Observatory different from other telescopes is its enormous camera and unusual design. The camera is the largest digital camera ever built, weighing about 3000 kilograms and fitted with 189 sensors. Each image it takes is so large that it contains more detail than 260 smartphone cameras combined. The giant mirrors, including a unique primary and tertiary mirror made from the same piece of glass, make sure the images stay sharp across a huge field of view.
- 4. What is the purpose of the Rubin Observatory?**
The purpose of the Rubin Observatory is to study both the slow and fast changes happening in the universe. Over its planned 10-year survey, it will create a map of about 20 billion galaxies and 20 billion stars, giving scientists an unmatched view of how the universe is structured. It will also track objects closer to home, such as asteroids and comets, and maybe even help locate a hidden ninth planet in our solar system. At the same time, it will catch quick, explosive events like supernovas, black holes feeding on stars, and gamma-ray bursts.
- 5. What is the most exciting part of the Rubin Observatory?**
Perhaps the most exciting part is that Rubin's data will be shared openly with the world. Anyone will be

able to explore its discoveries online.

Pickleballs Help Cut Vehicle Drag

- 1. What is drag?**
Drag is a force that acts against moving objects, like wind pushing back on a car. It makes vehicles work harder and use more fuel or power.
- 2. What did Anchal Sareen's team do with a pickleball? What does it do?**
The team led by Sareen covered a pickleball with a balloon to create a surface with tiny dimples that can change depth by pumping air in or out. Unlike a golf ball's fixed dimples, these adjustable dimples can be made deeper or shallower when needed. This smart surface helps reduce drag by almost half compared to a smooth, dimple-free surface.
- 3. What experiment did the researchers conduct?**
To test the idea, the researchers 3-D printed ball-shaped models and placed them in wind tunnels. They controlled the dimple depth using a vacuum pump and found that even a small change made a big difference in slowing down drag.
- 4. Besides reducing drag, what else does this technology do?**
By changing the dimples on one side of the ball, the surface can push the vehicle sideways or upward. This means vehicles could be steered in new ways without extra parts like fins or rudders.
- 5. How could this technology be used?**
This technology could help make airplanes fly more smoothly, help underwater robots explore the ocean more efficiently, and even save fuel by reducing resistance. One day, this smart dimpled skin could make vehicles lighter, faster, and easier to control.

Forces of Flight



1. B 2. D 3. A 4. D

Anti-Spice Compounds in Chili Peppers

1. Where does the heat in chili peppers come from?

The heat in chili peppers comes from special chemical compounds called capsaicinoids, with capsaicin being the most famous. Capsaicin is mostly found in the white, spongy part of the pepper called the placenta, where the seeds attach.

2. What happens when people eat chili peppers?

When people eat chili peppers, capsaicin binds to receptors in the mouth that sense heat and pain. This sends signals to the brain that cause the burning feeling we call “spice.”

3. What did scientists recently discover?

Even though many chili peppers have the potential to be very spicy, they sometimes are not as hot as expected. This happens because of five newly found “anti-spice” compounds inside some peppers. These compounds act like natural coolers that reduce the peppers’ heat. They work by blocking or changing how the spicy molecules behave

4. How do the capsaicin and anti-spice compounds work together to protect the pepper plants?

Capsaicin helps protect the pepper plants from animals that might eat them, since the heat is unpleasant for many creatures. However, the anti-spice compounds offer a gentler protection, possibly helping peppers survive better in different environments and attracting certain animals like birds that can spread their seeds

without being hurt by the spice.

5. How might these compounds help farmers and food makers?

Knowing about these compounds could help farmers and food makers create new kinds of peppers with just the right amount of heat. For example, people who want some spice but not too much could enjoy milder peppers that still taste flavourful.

The Fight Against Tan Spot

1. What is tan spot?

Tan spot is a disease that affects wheat plants and is caused by a fungus called *Pyrenophora tritici-repentis*. This fungus is not the most dangerous wheat disease, but it is very persistent and can cause serious damage to crops.

2. What does tan spot look like?

Tan spot shows up on wheat leaves as small tan or brown spots that grow into diamond-shaped patches surrounded by yellow halos. These spots can join together to cover large parts of the leaf. The infected leaves often wither and die, which weakens the plant and makes it harder for the wheat to grow properly.

3. What is one problem caused by tan spot?

One problem caused by tan spot is that it damages the leaves where photosynthesis happens. When tan spot damages the leaves, the plant can’t make enough food, which slows down growth and reduces the amount of wheat that farmers can harvest.

4. What happens to tan spot in winter and spring?

Tan spot survives through the winter on leftover wheat stalks and straw in the fields. In the spring, it produces spores that are spread by wind and rain, infecting new wheat plants. The disease grows quickly during wet and humid weather.

5. How are Canadian researchers and farmers trying to control tan spot?

Canadian researchers and farmers are trying to control tan spot through different methods. These include rotating crops. Farmers also use wheat varieties that are more resistant to tan spot and apply fungicides. Using proper farming techniques, like burying wheat residue in the soil and spacing rows of wheat plants farther apart, can help reduce the disease by lowering

humidity that helps spores spread.

The Water Cycle

1. What is the water cycle?

The water cycle is how water travels from the ground to the sky and back again.

2. What role does the Sun play in the water cycle?

The Sun plays a big role in this cycle because its heat causes water to change from liquid into a gas called water vapour. This happens mainly in oceans, lakes, and rivers. The process of water changing to vapour and rising into the air is called evaporation.

3. What happens after evaporation and transpiration move water into the atmosphere?

Together, evaporation and transpiration move water into the atmosphere, where it cools down and changes back into tiny water droplets. This change from gas back to liquid is called condensation, and it forms clouds in the sky. When the clouds get full of water droplets, the water falls back to Earth as rain, snow, sleet, or hail. This is called precipitation.

4. What happens once water reaches the ground?

Once water reaches the ground, it can flow over the surface into lakes, rivers, and oceans, or soak into the soil to become groundwater. Plants and animals use this water to survive, and the cycle begins again.

5. How can the water cycle be disrupted?

Human activities, like cutting down forests or building cities, can change how water moves. For example, when trees are removed, less water is released into the air through transpiration. Pollution can also harm the water cycle by contaminating water sources. Climate change is another problem that affects the cycle by making weather patterns less predictable, causing more floods or droughts.

Science News Quiz

THE VERA RUBIN OBSERVATORY

1. The observatory is named after Vera Rubin, the astronomer who provided some of the best evidence for the existence of **DARK MATTER** back in the 1970s.

Science News Answer Key

2. The purpose of the Rubin Observatory is to study both the slow and fast changes happening in the universe.

True

PICKLEBALLS HELP CUT VEHICLE DRAG

1. Drag makes vehicles work **HARDER** and use more fuel or power.
2. The researchers controlled the dimple depth using a vacuum pump and found that even big changes made only a little bit of difference in slowing down drag.
False – Even small changes made a big difference

ANTI-SPICE COMPOUNDS IN CHILI PEPPERS

1. When people eat chili peppers, capsaicin binds to receptors in the mouth that sense what?
B. Heat and pain
2. These anti-spice compounds are part of an interesting chemical **BALANCE** inside chili peppers.

THE FIGHT AGAINST TAN SPOT

1. What causes tan spot?
C. A fungus
2. In the spring, tan spot produces **SPORES** that are spread by wind and rain, infecting new wheat plants.

THE WATER CYCLE

1. The **SUN** plays a big role in this cycle because its heat causes water to change from liquid into a gas called water vapour.
2. What is it called when the clouds get full of water droplets and the water falls back to Earth?
A. Precipitation