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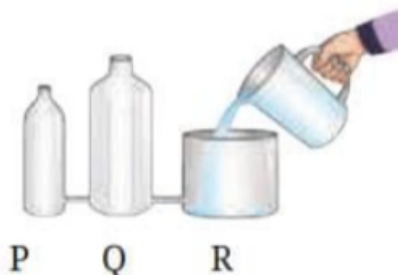
PRESSURE, WINDS, STORMS
Class 08 - Science (Curiosity)

Time Allowed: 1 hour and 30 minutes

Maximum Marks: 143

1. What would be the impact on wind if global temperatures were unchanged over large areas? [1]
 - a) It would rain constantly
 - b) Winds would blow faster due to uniform cooling
 - c) There would be minimal to no wind movement
 - d) Wind patterns would be unpredictable
2. A rubber sucker (M) is pressed on a flat smooth surface and an identical sucker (N) is pressed on a rough surface: [1]
 - a) Both M and N will not stick to their surfaces.
 - b) M will stick but N will not stick.
 - c) M will not stick but N will stick.
 - d) Both M and N will stick to their surfaces.
3. Why do heavier water droplets stay in the lower part of the clouds? [1]
 - a) Because of gravitational pull
 - b) They react with lighter ice particles
 - c) Due to strong winds pushing them downward
 - d) They are positively charged and prefer higher altitudes
4. Which statement about atmospheric pressure is correct? [1]
 - a) It is too small to have measurable effects
 - b) It acts in all directions and is balanced by internal body pressure
 - c) It can crush us unless we breathe deeply
 - d) It acts only downward
5. How do narrow straps behave when carrying a heavy bag? [1]
 - a) They increase pressure on shoulders
 - b) They spread out the weight
 - c) They reduce pressure on shoulders
 - d) They are unrelated to pressure
6. What is the primary cause of wind formation? [1]
 - a) The rotation of the Earth
 - b) Temperature differences in the atmosphere
 - c) Humidity levels in the troposphere
 - d) Difference in air pressure
7. Which of the following is the SI unit of pressure? [1]
 - a) Joule per second
 - b) Newton per square meter (N/m²)
 - c) Kilogram per meter
 - d) Watt per meter

8. During lightning, we should protect ourselves by [1]
- a) Using an umbrella with a metallic rod b) Crouching down in a low-lying open area
- c) Going into water d) Standing near the tall objects
9. What causes the air to expand and cool when it rises? [1]
- a) It absorbs heat from the sun b) It exchanges heat with surrounding air
- c) It enters a lower pressure area d) It absorbs moisture from the environment
10. What would likely happen if the pressure difference is greater between two regions? [1]
- a) Airflow would be slower b) Airflow would be faster
- c) The higher pressure region would shrink d) No movement would occur
11. High-speed winds can [1]
- a) Blow off roofs
- b) All of these
- c) Result in lower air pressure above the roofs of the houses compared to air pressure below the roofs
- d) create a low-pressure area
12. Why is it essential for the bases of dams to be broad? [1]
- a) To cool down water
- b) To counter horizontal water pressure and support the dam structure
- c) To decorate the dam
- d) To keep a balanced temperature
13. Look at figure carefully. Vessel R is filled with water. When pouring of water is stopped, the level of water will be _____. [1]



- a) the highest in vessel Q b) the highest in vessel P
- c) the highest in vessel R d) equal in all three vessels
14. In a cyclone, the region of the lowest pressure is at the centre, known as: [1]
- a) The eye of the cyclone b) The pressure of the cyclone
- c) The body of the cyclone d) The air of the cyclone

31. What weather conditions lead to the formation of storms? [1]
32. What is a thunderstorm? Explain the process of its formation. [2]
33. Why are winds stronger on some days than on others? [2]
34. Discuss the science behind why inflated and uninflated balloons equalize in size over time. [2]
35. Why does air move from high pressure to low pressure in weather phenomena? [2]
36. Evaluate the efficacy of using lightning conductors on buildings in urban areas. [2]
37. Why do overhead water tanks provide stronger water flow to taps than ground tanks? [2]
38. An elephant stands on four feet. If the area covered by one foot is 0.25 m^2 , calculate the pressure exerted by the elephant on the ground if its weight is 20000 N. [2]
39. How does the concept of air pressure help explain the difference between sea breeze during day and night? [2]
40. How can you demonstrate at home that liquid pressure depends on depth? [2]
41. Why does increasing the contact area reduce pressure in everyday situations like carrying bags? [2]
42. Create a plan for a community awareness campaign on lightning safety measures. [2]
43. There are two boats, A and B. Boat A has a base area of 7 m^2 , and 5 persons are seated in it. Boat B has a base area of 3.5 m^2 , and 3 persons are seating in it. If each person has a weight of 700 N, find out which boat will experience more pressure on its base and by how much? [2]
44. How does height of a liquid column affect pressure? Mention one application. [2]
45. Explain, with an example, how area affects pressure in daily life. [2]
46. Explain why holes are made in banners and hoardings. [2]
47. Describe an activity to show that air flows from a region of high pressure to a region of low pressure. [3]
48. Explain the reason a balloon inflates when air is blown into it using pressure concepts. [3]
49. Define the terms 'pascal' and 'millibar' as they relate to pressure measurement. [3]
50. What does atmospheric pressure mean and how is it important for life on Earth? [3]
51. How might weather satellites help in reducing the impact of cyclones? [3]
52. Describe how atmospheric pressure balances with bodily pressure to prevent harm. [3]
53. How does the ocean water contribute to cyclone formation? [3]
54. Explain the process by which a low-pressure area is formed in cyclonic conditions. [3]
55. Describe the role of air pressure in the development of a cyclone. [3]
56. Can air pressure really crush us? [3]
57. Differentiate between a thunderstorm and a cyclone on the basis of formation and scale. [3]
58. What causes storms and cyclones? If the Earth stopped rotating, would cyclones still form? [3]
59. **State whether the given statement is True or False:** [4]
 - (a) Air flows from a region of higher pressure to a region of lower pressure. [1]
 - (b) Storms are more frequent in temperate regions than in tropical regions like India. [1]
 - (c) In the process of storms forming, cold air rises and warm air replaces it. [1]
 - (d) Weather is stormy at the eye of a cyclone. [1]
60. **Read the following text carefully and answer the questions that follow:** [4]

High-speed winds reduce air pressure in the regions they pass over. The faster the wind, the lower the pressure created, resulting in a pressure difference between surrounding air and areas under roofs or other structures. This pressure difference can lift roofs or cause damage during

storms. Opening doors and windows reduces the pressure difference inside and outside houses, helping to prevent structural damage during strong winds.

Questions:

- a. Why do high-speed winds sometimes lift roofs during storms? **(1)**
- b. Explain how air pressure changes when high-speed winds blow. **(1)**
- c. How does opening doors and windows help during storms with high-speed winds? **(2)**

OR

Describe the relationship between wind speed and air pressure, and its effect on structures. **(2)**

61. **Read the following text carefully and answer the questions that follow:** **[4]**

Storms form when warm, moist air rises, creating low pressure, and cooler air flows in, causing wind circulation. Condensed water droplets form clouds, and heavy drops fall as rain, hail, or snow. Strong winds in clouds cause charge separation, producing lightning when charges discharge. Thunder results from rapidly heated air. Thunderstorms, common in India, can be dangerous. Lightning conductors safely channel charges to the ground, protecting buildings and people.

Questions:

- a. What causes lightning during a thunderstorm? **(1)**
- b. Why do thunderstorms occur more frequently in tropical regions like India? **(1)**
- c. Explain how thunder is produced during a lightning event. **(2)**

OR

How does a lightning conductor protect buildings and people during thunderstorms? **(2)**

62. **Read the following text carefully and answer the questions that follow:** **[4]**

Wind is formed due to differences in air pressure. Air always moves from a high-pressure region to a low-pressure region until balance is reached. This principle explains the occurrence of sea breeze and land breeze. During the day, land heats faster, creating low pressure and drawing cooler air from the sea. At night, the sea remains warmer, forming low pressure above water and causing wind to blow from land to sea.

Questions:

- a. What is the main cause of the formation of wind? **(1)**
- b. Why does air move from one region to another, forming wind? **(1)**
- c. Explain the phenomenon of sea breeze during the daytime. **(2)**

OR

Differentiate between sea breeze and land breeze with reasons. **(2)**

63. **Fill in the blanks:** **[5]**

- (a) The sound produced by the rapid expansion of air due to lightning is called _____. **[1]**
- (b) A storm accompanied by thunder and lightning is known as a _____. **[1]**
- (c) The calm, low-pressure center of a cyclone is called the _____. **[1]**
- (d) A sudden rise of sea water pushed by cyclone winds onto land is called a storm _____. **[1]**
- (e) Daytime coastal wind from sea to land is called a _____ breeze. **[1]**

64. Discuss how pressure differences create winds and compare calm conditions with strong wind conditions using clear examples. **[5]**

- 65. Describe an investigation to show that liquid pressure increases with depth and acts in all directions, and explain what the results mean. **[5]**
- 66. Summarize the process that leads to the formation of land and sea breezes. **[5]**
- 67. Explain how pressure depends on force and area, and describe two design choices in everyday tools that use this idea to work better. **[5]**
- 68. Explain the life cycle of a cyclone from formation over warm oceans to weakening over land, and relate it to pressure changes. **[5]**

USP

Solution
PRESSURE, WINDS, STORMS
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1.
(c) There would be minimal to no wind movement
Explanation:
Wind primarily moves due to temperature (and pressure) differences.
2.
(b) M will stick but N will not stick.
Explanation:
The rubber sucker sticks due to atmospheric pressure creating a vacuum on a smooth surface. On a rough surface, air leaks in, preventing the vacuum and thus the sticking.
3. **(a)** Because of gravitational pull
Explanation:
Gravitational pull causes heavier droplets to remain lower in the clouds.
4.
(b) It acts in all directions and is balanced by internal body pressure
Explanation:
It acts in all directions and is balanced by internal body pressure
5. **(a)** They increase pressure on shoulders
Explanation:
Narrow straps apply more pressure, as the force (weight of the bag) is concentrated over a smaller area.
6.
(d) Difference in air pressure
Explanation:
Wind forms due to differences in air pressure between two regions.
7.
(b) Newton per square meter (N/m^2)
Explanation:
The unit of pressure, being force per unit area, is expressed as newton per square meter, or pascal.
8.
(b) Crouching down in a low-lying open area
Explanation:
During a thunderstorm, a person should avoid tall objects, water bodies, and metallic objects because they increase the risk of being struck by lightning. Crouching down in a low-lying open area is a safer position.
9.
(c) It enters a lower pressure area
Explanation:
Rising into a lower pressure area allows air to expand and cool.
10.
(b) Airflow would be faster

Explanation:

Greater pressure difference increases air speed.

11.

(b) All of these

Explanation:

Fast-moving air creates a low-pressure area, which can cause a pressure difference above and below roofs. This pressure difference can even blow off roofs during strong winds.

12.

(b) To counter horizontal water pressure and support the dam structure

Explanation:

Broad bases withstand intense horizontal pressure near the bottom due to water.

13.

(d) equal in all three vessels

Explanation:

The level of water in connected vessels (communicating vessels) will be the same regardless of shape, as liquid pressure depends on the height of the column, not the vessel's shape or width.

14. **(a)** The eye of the cyclone

Explanation:

The central region of a cyclone, called the eye, has the lowest air pressure. Air from surrounding higher-pressure areas moves toward this low-pressure center, making it an important feature of a cyclone.

15. **(a)** Pascal (Pa)

Explanation:

Pascal (Pa) is the unit of pressure in the SI system.

16.

(b) Both A and R are true but R is not the correct explanation of A.

Explanation:

Wind increases low pressure above, which contrasts with higher pressure below, leading to roof detachment.

17. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation:

Being informed through weather reports allows for timely action to prevent losses.

18. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation:

Broad straps increase the area over which the bag's weight acts. Since pressure decreases when the same force is distributed over a larger area, broad straps exert less pressure on the shoulders and feel more comfortable.

19.

(b) Both A and R are true but R is not the correct explanation of A.

Explanation:

Noise is not related to pressure difference; rather, dynamics of air create low pressure above.

20. Cyclones can destroy crops, cause seawater to contaminate fertile soil, and lead to long-term soil degradation, affecting agriculture.

21. The unfolded sheet covers a larger area, increasing the air pressure exerted below.

22. Rising air expands and cools, causing moisture to condense into droplets, which merge and fall as rain.

23. Air moves from a high-pressure region to a low-pressure region.
24. Examples include swaying trees and slamming doors.
25. Nitrogen, oxygen, and carbon dioxide are found in atmospheric air.
26. When negative charges in clouds approach positively charged ground, air's insulating property breaks, causing a flash of lightning.
27. $\text{Pressure} = \frac{\text{Force}}{\text{Area}} = \frac{200\text{N}}{4\text{m}^2} = 50 \text{ N/m}^2$.
28. Cyclones weaken after reaching land as they lose the supply of moist air from the ocean, reducing their energy source.
29. Air escapes from the tube, moving from high pressure inside to lower pressure outside, causing collapse.
30. Blowing air between the balloons creates a low-pressure area.
31. Warm and moist air rises, creating low-pressure areas. Cooler air replaces it, leading to wind and forming clouds, followed by rain and storms.
32.
 - A thunderstorm is a storm accompanied by lightning, thunder, and often heavy rain.
 - It forms when warm, moist air rises rapidly, cools, and condenses into clouds.
 - Strong upward and downward winds cause ice particles and water droplets to rub, building static charges (positive at the top, negative at the bottom).
 - When charges build sufficiently, air's insulating property breaks, leading to lightning discharges and thunder.
33.
 - Winds are stronger on some days due to greater differences in air pressure (pressure gradients) between different locations.
 - When a weather system, such as a storm or a cyclone, creates steep pressure differences, air moves rapidly from high-pressure areas to low-pressure areas, resulting in strong winds.
 - Temperature contrasts (such as between land and sea, or during weather fronts), and local topography can intensify these differences and wind speeds.
34. Inflated and uninflated balloons equalize in size because air transfers from high-pressure regions to low-pressure regions until pressure is balanced.
35. Air moves from high pressure to low pressure to equalize differences in atmospheric pressure, contributing to various weather phenomena like wind.
36. Lightning conductors provide a safe path for electrical charges to ground, preventing structural damage and hazards. However, their efficacy depends on correct placement and structural conductability. In densely populated urban areas, they significantly reduce risks, but frequent maintenance and upgrades are necessary to ensure effectiveness.
37. Overhead water tanks provide stronger flow because water at greater height exerts more pressure due to gravity. This increased pressure pushes water forcefully through pipes compared to ground-level tanks.
38.
 - Total area covered by four feet = $4 \times 0.25 \text{ m}^2 = 1 \text{ m}^2$.
 - $\text{Pressure} = \frac{\text{Force}}{\text{Area}} = 20000 \text{ N}/1 \text{ m}^2 = 20000 \text{ N/m}^2$ (or 20000 Pa).
39. During the day, the land heats faster than the sea, creating a low-pressure area, leading to a sea breeze as cooler air from the sea moves in. At night, the sea retains heat, forming a low-pressure area over water, causing air from the land to flow toward the sea, generating a land breeze. Both processes arise from differences in air pressure.
40. Make small holes at different heights on the side of a water bottle and fill it; the lowest hole shoots water the farthest. This shows pressure increases with depth due to the taller water column above that point.
41. Pressure equals force divided by area, so spreading the same force over a larger area reduces pressure on the surface. That is why wide straps or a cloth pad under a load feel more comfortable.
42. The campaign should include educational workshops, distribution of informational brochures, and demonstrations on lightning safety. Emphasize precautions like avoiding tall objects, seeking shelter, and staying grounded during storms. Engage local schools and community centers to spread awareness and minimize risks associated with lightning.

43. Weight per person = 700 N

Boat A: Total weight = $5 \times 700 \text{ N} = 3500 \text{ N}$; Pressure = $3500 \text{ N} / 7 \text{ m}^2 = 500 \text{ Pa}$.

Boat B: Total weight = $3 \times 700 \text{ N} = 2100 \text{ N}$; Pressure = $2100 \text{ N} / 3.5 \text{ m}^2 = 600 \text{ Pa}$.

Boat B experiences more pressure on its base, by 100 Pa.

44. Greater height gives greater pressure at the bottom ($P \propto \text{depth}$).

An application of this is that overhead tanks are placed high to supply good water pressure.

45. Pressure depends on the force applied and the area over which it acts. A narrow bag strap exerts more pressure on the shoulder because the force is concentrated on a smaller area, causing discomfort.

Broad straps spread the force over a larger area, reducing pressure and increasing comfort.

46. Holes allow high-speed winds to pass through, reducing the pressure difference between the front and back. Without holes, wind pressure could tear or blow away the banners, especially during storms.

- 47.
- Take two similar balloons and a straw. Insert one end of the straw into an uninflated balloon and secure it.
 - Inflate the second balloon, secure its mouth, then insert the other end of the straw into it without leaking air.
 - Air flows from the inflated (high-pressure) balloon to the uninflated (low-pressure) one through the straw, causing the inflated balloon to shrink and the other to expand until pressures equalize.

48. When air is blown into a balloon, its internal pressure increases, exerting force on its walls. Air pressure inside the balloon surpasses atmospheric pressure outside, causing inflation. The balanced distribution of pressure in all directions ensures uniform expansion, preventing it from collapsing.

49. Pascal (Pa) is the SI unit of pressure, defined as one newton per square meter (N/m^2). Millibar (mb) is a practical unit of air pressure, equivalent to 100 Pascal. These units help measure atmospheric pressure, crucial for meteorological studies and understanding Earth's weather systems.

50. Atmospheric pressure is the force exerted by the weight of air in the atmosphere on the Earth's surface. It is crucial for life on Earth as it influences weather patterns, supports plant life by enabling gas exchange, and maintains balance with bodily fluids, preventing organisms from being crushed under atmospheric weight.

51. Weather satellites play a key role in reducing cyclones' impact by providing data that allow meteorologists to track their development and predict their paths accurately. This information enables timely warnings and alerts, allowing communities to evacuate, prepare shelters, and enact measures to protect life and property, ultimately minimizing harm.

52. Atmospheric pressure doesn't harm due to an internal equilibrium with bodily pressure. Fluids and gases in tissues maintain pressure equal to external forces. This balance neutralizes excessive atmospheric weight, ensuring organisms endure without being crushed or experiencing adverse physiological effects.

53. Cyclones draw their energy from warm ocean water. When surface water is heated above about 27°C , it evaporates rapidly, adding moisture and heat to the air above. This warm, moist air rises, creating a low-pressure zone near the surface. Surrounding air rushes in, and the rising air cools, condenses, and releases latent heat, further fueling the system. This continuous cycle intensifies the cyclone, making ocean heat a crucial factor in its formation and strength.

54. A low-pressure area in cyclonic conditions is formed when warm, moist air above heated ocean waters rises. As it ascends, it cools and releases heat, causing further warming of the surrounding air and creating an area of lower pressure. This prompts surrounding air to rush in to occupy the space, perpetuating the cycle of rising warm air and pressure drop.

55. In a cyclone, air pressure plays a crucial role as the rising warm air creates a low-pressure area. Air from surrounding high-pressure areas rushes in to fill this void, and it also rises due to the heat. The continuous cycle of pressure changes causes the system to spin, forming a cyclone.

- 56.
- Atmospheric pressure is indeed very strong (about 101,325 Pa at sea level, or approximately 10 tons on your body surface!).
 - However, the pressure inside our bodies matches the outside pressure, balancing the force.
 - Without this balance (for example, if strong pressure differentials appear suddenly), air pressure can cause serious damage-as seen when containers or objects are evacuated of air and crushed by outside air.

57.
 - Thunderstorm: Forms from warm, moist air rising rapidly; strong updrafts/downdrafts, charge separation in clouds causing lightning and thunder; typically local and short-lived.
 - Cyclone: Forms over warm oceans; rising moist air and latent heat release create sustained low pressure; Earth's rotation imparts spin; features an "eye", very strong winds, heavy rain; impacts a large region over days.
58.
 - **Storms and cyclones are caused by warm, moist air rising rapidly.** As this air cools, water vapor condenses, releasing heat and causing strong winds and clouds. Cyclones specifically form over warm oceans, with rotation guided by Earth's spin (the Coriolis effect).
 - **If the Earth stopped rotating, cyclones as we know them wouldn't form.** The rotation (Coriolis force) is what makes winds spiral, creating the cyclonic structure. Without it, storms could still occur, but organized, rotating cyclones would not.
59. State whether the given statement is True or False:
- (a) **(a) True**
Explanation:
Air flows from a region of higher pressure to a region of lower pressure.
- (b) **(b) False**
Explanation:
Storms are more frequent in hot, humid, and tropical regions like India.
- (c) **(b) False**
Explanation:
False
- (d) **(b) False**
Explanation:
The eye of a cyclone is calm, with no stormy weather.
60. a. High-speed winds sometimes lift roofs during storms because they reduce the air pressure above the roof, creating a pressure difference between the inside and outside of the house. This difference can cause the roof to be lifted.
- b. When high-speed winds blow, they reduce the air pressure in the area over which they pass. The surrounding higher-pressure air pushes toward the low-pressure area, causing effects like lifting objects or roofs during storms.
- c. Opening doors and windows during high-speed winds reduces the pressure difference between the inside and outside of a house. This prevents excessive upward force on the roof, lowering the chances of the roof being lifted or damaged by strong winds during a storm.
- OR**
- The speed of wind is inversely related to air pressure: faster winds create lower pressure. When high-speed winds pass over roofs, the low pressure above combined with higher pressure below creates a force that can lift weak roofs. Understanding this helps in designing buildings to withstand storms.
61. a. Lightning during a thunderstorm is caused by the rubbing of ice and water particles in clouds, which leads to charge separation. When the charges discharge, lightning occurs.
- b. Tropical regions are hot and humid, which causes warm moist air to rise rapidly. This rising air creates low-pressure areas, leading to strong wind circulation, condensation of moisture, cloud formation, and ultimately thunderstorms with rain, lightning, and thunder.
- c. Thunder occurs due to the rapid heating of air around a lightning bolt. The intense heat causes the air to expand explosively. This sudden expansion produces shock waves that travel through the air as loud sounds, which we hear as thunder, often occurring immediately after observing lightning.
- OR**
- A lightning conductor is a pointed metallic rod installed on buildings, with its lower end buried in the ground. It provides a safe path for electric charges from lightning to flow into the ground. This prevents charges from passing through the building, reducing the risk of fire, structural damage, or injury to people.
62. a. Wind is formed mainly due to the unequal heating of land and water. The differences in air pressure created by heating differences cause air to move from high-pressure areas to low-pressure areas,

resulting in wind.

- b. Air moves from a region of high pressure to a region of low pressure. This movement occurs until the pressure equalizes. Thus, wind is simply the horizontal flow of air caused by pressure differences in the atmosphere.
- c. During the day, land heats up faster than water. The warm air above land becomes lighter and rises, creating a low-pressure area. The cooler, high-pressure air from the sea moves towards the land to replace it. This flow of cool air from sea to land is called a sea breeze, which provides relief during hot days.

OR

Sea breeze occurs during the day when land heats faster, creating low pressure over land and causing cool air from the sea to blow towards land. Land breeze occurs at night, as water remains warmer than land. This creates low pressure over the sea, drawing cooler air from land towards the sea. Both result from pressure differences due to unequal heating.

63. Fill in the blanks:

- (a) thunder
- (b) thunderstorm
- (c) eye
- (d) surge
- (e) sea

64. Winds are formed when air moves from regions of high pressure to regions of low pressure. This movement occurs because nature always tries to balance pressure differences. When the pressure difference is very small, the air flows slowly, producing calm conditions or gentle breezes, such as those felt on a pleasant evening. However, when the pressure difference is large, the air rushes rapidly, creating strong winds. For example, during a cyclone, the pressure at the center becomes extremely low compared to surrounding areas, causing violent winds that can uproot trees and damage houses. Thus, wind strength depends on pressure gradients.

65. ◦ Take a plastic bottle and make three small holes at different heights on one side, then fill it with water. You will see jets from the lower holes shoot farther, proving pressure increases with depth clearly and consistently.
- Also, water flows sideways from the holes, showing pressure acts in all directions, not just downward. This explains why deep parts of dams face stronger sideways pushes. It also shows why taps connected to higher tanks give stronger flow efficiently and reliably.

66. Land and sea breezes occur due to the different heating rates of land and water. During the day, land heats up faster than the sea, so the air above the land becomes warmer and lighter, creating a low-pressure area. Cooler air from the sea, which is at higher pressure, moves towards the land, forming a sea breeze. At night, the process reverses. Land cools down faster than water, so the air above the sea is warmer and forms a low-pressure area. Cooler, high-pressure air from the land then flows towards the sea, creating a land breeze.

67. Pressure is defined as the force applied per unit area, expressed as $P = F/A$. This means pressure increases when a given force acts on a smaller area, and decreases when the same force is spread over a larger area. Everyday tools are designed using this principle. For example, **knife blades** are made sharp with very small surface areas at the edge so that even a small force produces large pressure, making cutting easier. Similarly, **tractor tires** are wide so the large surface area reduces pressure, preventing them from sinking into soft soil.

68. ◦ Over warm seas, moist air heats, rises, and creates a low-pressure center at the surface. As water vapor condenses into rain, heat is released, making air rise more and lowering pressure further.
- Surrounding air rushes in and spins due to Earth's rotation, building a powerful system with an eye of very low pressure. Around the eye, winds are strongest and rain is heavy. After landfall, the cyclone loses warm, moist air and weakens due to friction and lack of fuel.