تم تحميل هذا الملف من موقع المناهج الإماراتية

شرح درس circulation oceanic and Atmospheric الدورة الجوية والمحيطية منهج انسباير

تاريخ إضافة الملف على موقع المناهج: 18-11-2024 11:46:34

المزيد من مادة علوم:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

التواصل الاجتماعي بحسب الصف السادس

صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف السادس والمادة علوم في الفصل الأول

1	حل تجميعة صفحات الكتاب وفق الهيكل الوزاري منهج انسباير
2	حل تجميعة مراجعة وفق الهيكل الوزاري
3	حل أسئلة الامتحان النهائي القسم الورقي منهج انسباير
4	أسئلة الامتحان النهائي القسم الورقي منهج انسباير
5	تجميعة أسئلة مراجعة وفق الهيكل الوزاري مع أسئلة امتحانات سابقة

Atmospheric and oceanic circulation

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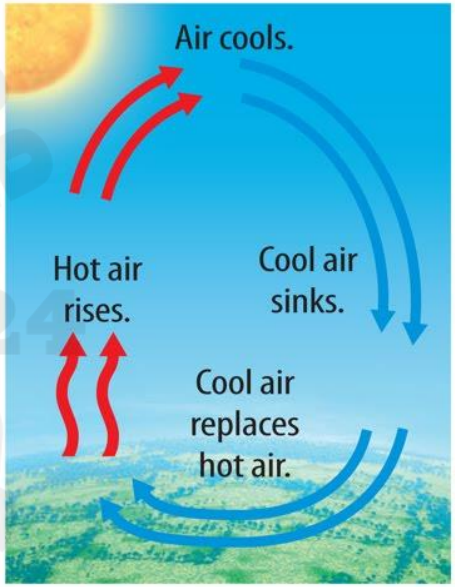
+971566494600

Why does air flow?

- Because of the differences in air pressure.

Wind: is the movement of air from areas of high pressure to areas of low pressure.

The Sun's energy warms Earth unevenly. Warm air rises and puts less pressure on Earth than cooler air. Cold air sinks and puts more pressure on Earth. These differences in temperature create differences in air pressure, creating both local and global winds.

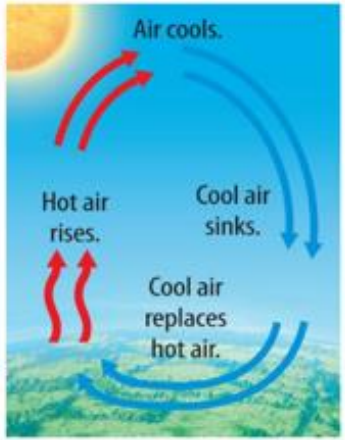


- Warm air rises and puts less pressure on Earth than cooler air.

يرتفع الهواء الدافئ ويخضع ضغطًا أقل على الأرض مقارنة بالهواء البارد

- Cold air sinks and puts more pressure on Earth.

يغرق الهواء البارد ويزيد الضغط على الأرض



These differences in temperature create differences in air pressure, creating both local and global winds.

تخلق هذه الاختلافات في درجات الحرارة اختلافات في ضغط الهواء ، مما يؤدي إلى حدوث رياح محلية وعالمية

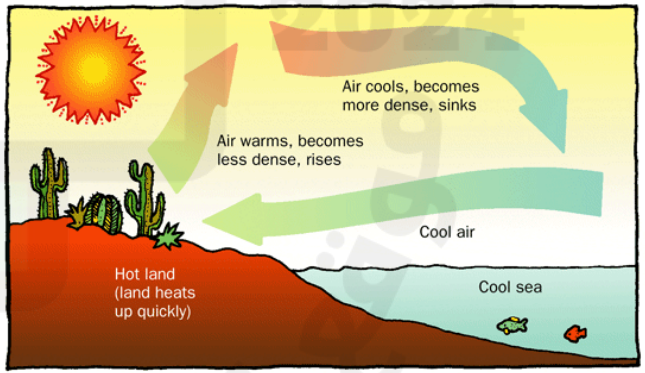
What patterns do global winds form?

Recall that conduction occurs where the atmosphere contacts Earth.

Convection: the transfer of thermal energy by the movement of particles within matter.

As molecules of air close to Earth's surface are heated by conduction, they spread apart, and air becomes less dense Less dense air rises, transferring thermal energy to higher altitudes.

عندما يتم تسخين جزيئات الهواء القريبة من سطح الأرض عن طريق التوصيل ، فإنها تتباعد ، ويصبح الهواء أقل كثافة. يرتفع الهواء الأقل كثافة ، وينقل الطاقة الحرارية إلى ارتفاعات أعلى



To summarize!!

- Is the way in which heat is transferred through fluids (liquids and gases) by the movement of particles themselves

هي الطريقة التي تنتقل بها الحرارة عبر السوائل (السوائل والغازات) بحركة الجسيمات نفسها

- When particles are heated they expand and get less dense and rise; the cooler the particles get they contact to become more dense and sink.

عندما يتم تسخين الجسيمات فإنها تتمدد وتصبح أقل كثافة وترتفع. كلما زادت برودة تلامس الجسيمات تصبح أكثر كثافة وتغرق

Global winds types:

1. The polar easterlies: are cold winds that blow from east to west near the North Pole and the South Pole. Polar easterlies begin as dense polar air that sinks.

2. The prevailing westerlies: are steady winds that flow from west to east between latitudes 30°N and 60°N, and 30's and 60'S.

3. The trade winds: are steady winds that flow from east to west between 30 N latitude and 30'S latitude.

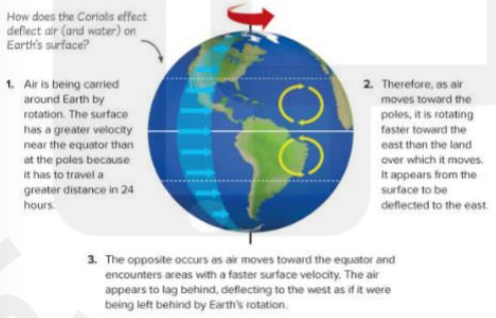
Why do the major wind systems blow in certain directions?

Because of:

1. Earth rotation

2. Coriolis effect: when Earth's rotation causes moving air and water to appear to curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

The coriolis effect describes how objects and fluid matter, like air and water, move in an apparent curved path rather than a straight line. It is the coriolis effect that produces the curving patterns of circulating wi



3. Effect of Landmasses

The Coriolis effect is not the only factor that influences the motion of wind Landmasses also affect the speed and direction of wind systems. For example, the westerlies in the Southern Hemisphere are locally very strong because this system is mostly over the oceans and has few continents to disrupt the wind.

Additionally, when wind meets a large feature, such as a mountain, it is deflected, or forced, upward

Why do ocean water flow?

The uneven heating of Earth has an effect on ocean water that is similar to its effect on air. It causes differences in physical properties that cause ocean water to flow.

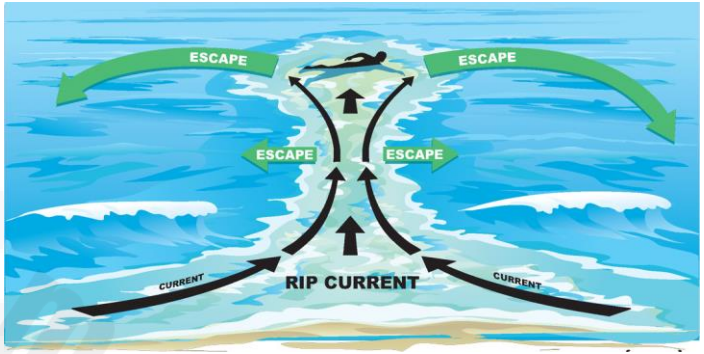
Water flow is caused and affected by the following factors:

1. Density Current

Density current: the vertical movement of water caused by differences in density.

What causes the density current? ما سبب كثافة التيار

- High salinity and cold temperatures cause water to become more dense.
- This helps create currents of water deep in the ocean as water flows from areas of high density to areas of low density.



2. Surface Current

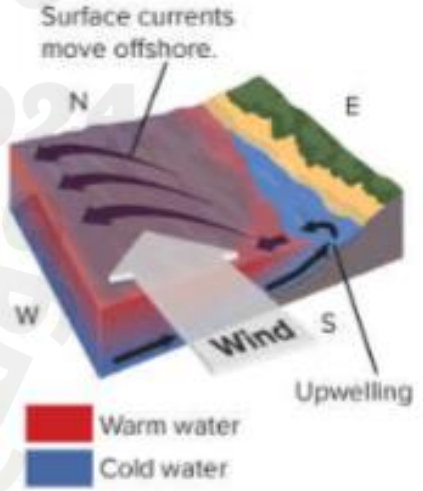
Surface current: a wind-driven current that carries ocean water horizontally across the ocean's surface.

- As the wind blows over ocean water, it transfers energy to the water. The moving air particles drag on the surface of the water and cause the top portion of the ocean to move.
- Surface currents move toward the poles, they cool and sink.

3. Upwelling

Upwelling: is the vertical movement of water toward the ocean's surface.

- As the wind blows over ocean water, it transfers energy to the water. The moving air particles drag on the surface of the water and cause the top portion of the ocean to move.
- Upwelling occurs when the wind blows across the ocean's surface and pushes water away from an area. Deeper, colder water is then forced to the surface.



What global pattern do ocean currents form?

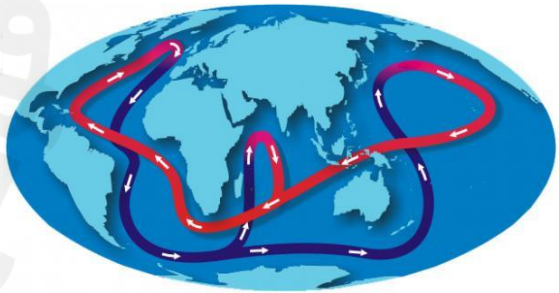
- Surface currents, upwelling, and density currents combine to form THE GREAT OCEAN CONVEYER BELT.

- Variations in temperature and salinity drive this global pattern of interconnected ocean currents.

What is the Great Ocean Conveyor Belt and what does it affect?

It is a model that explains how ocean currents circulate thermal energy around Earth affecting weather and climate.

إنه نموذج يشرح كيف تقوم تيارات المحيطات بتدوير الطاقة الحرارية حول الأرض مما يؤثر على الطقس والمناخ.



Wind الرياح	is the movement of air from areas of high pressure to areas of low pressure. هي حركة الهواء من مناطق الضغط العالي إلى مناطق الضغط المنخفض
Convection الحمل الحراري	the transfer of thermal energy by the movement of particles within matter. نقل الطاقة الحرارية بحركة الجسيمات داخل المادة
The polar easterlies الرياح القطبية الشرقية	are cold winds that blow from east to west near the North Pole and the South Pole. Polar easterlies begin as dense polar air that sinks. رياح باردة تهب من الشرق إلى الغرب بالقرب من القطب الشمالي والقطب الجنوبي. تبدأ الأعاصير القطبية على شكل هواء قطبي كثيف يغوص
The prevailing westerlies الرياح الغربية السائدة	are steady winds that flow from west to east between latitudes 30°N and 60°N, and 30's and 60'S هي رياح ثابتة تتدفق من الغرب إلى الشرق بين خطي عرض 30 درجة شمالاً و 60 درجة شمالاً ، و 30 و 60 درجة جنوبا.
The trade winds الرياح التجارية	are steady winds that flow from east to west between 30 N latitude and 30'S latitude. رياح ثابتة تتدفق من الشرق إلى الغرب بين خط عرض 30 شمالاً وخط عرض 30 درجة جنوبا.

Coriolis effect تأثير كوريوليس	when Earth's rotation causes moving air and water to appear to curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. عندما يتسبب دوران الأرض في انحناء الهواء والماء المتحركين إلى اليمين في نصف الكرة الشمالي وإلى اليسار في نصف الكرة الجنوبي
Density current تيار الكثافة	the vertical movement of water caused by differences in density. هو الحركة العمودية للماء الناتجة عن اختلافات في الكثافة
Surface current التيار السطحي	a wind-driven current that carries ocean water horizontally across the ocean's surface. تيار تحركه الرياح يحمل مياه المحيط أفقياً عبر سطح المحيط
Upwelling الموجات الصاعدة	is the vertical movement of water toward the ocean's surface. هي الحركة العمودية للمياه باتجاه سطح المحيط

When cool, dense air from over the water flows inland, it's called a _____.

- land breeze
- polar easterly
- jet stream
- sea breeze

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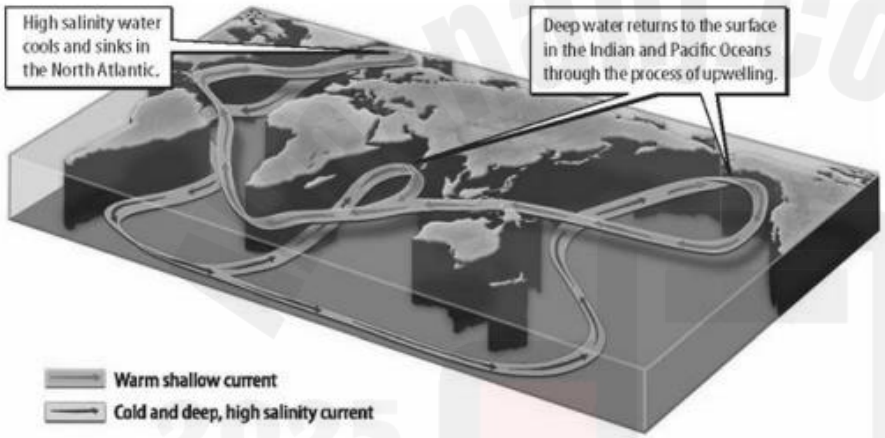
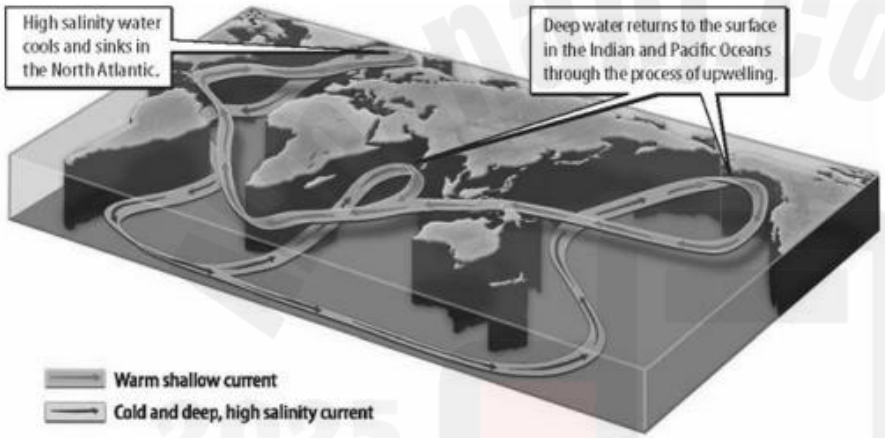
The figure shows the Great Ocean Conveyor Belt. Which best describes what this model represents?



- how the density of water differs between the North Atlantic and other parts of the ocean
- how ocean currents change the salinity of water
- how ocean currents move heat energy around Earth
- how the salinity of water affects its density

The figure shows the Great Ocean Conveyor Belt. Which best describes what this model represents?



- how the density of water differs between the North Atlantic and other parts of the ocean
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2) The Coriolis Effect helps distribute heat around the surface of Earth.

- ○ True
- ○ False

2) The Coriolis Effect helps distribute heat around the surface of Earth.

- ○ True
- ○ False

3) Which sentence about an ocean current is correct?

- **A)** Upwelling is caused by winds that blow on the ocean's surface.
- **B)** Upwelling moves water horizontally.
- **C)** Surface currents are caused by differences in water density.
- **D)** Surface currents move vertically through the water.

3) Which sentence about an ocean current is correct?

- **A)** Upwelling is caused by winds that blow on the ocean's surface.
- **B)** Upwelling moves water horizontally.
- **C)** Surface currents are caused by differences in water density.
- **D)** Surface currents move vertically through the water.

5) The _____ _____ is the wind system responsible for the movement of weather from west to east across most of the continental United States.

5) The The prevailing westerlies is the wind system responsible for the movement of weather from west to east across most of the continental United States.

6) Steady winds between the equator and 30° latitude north or south are known as the _____.

- **A)** prevailing westerlies
- **B)** jet stream
- **C)** polar easterlies
- **D)** trade winds

6) Steady winds between the equator and 30° latitude north or south are known as the _____.

- **A)** prevailing westerlies
- **B)** jet stream
- **C)** polar easterlies
- **D)** trade winds

7) An increase in ocean salinity can change _____ and create a current.

- ○ **A)** the temperature near the poles
- ○ **B)** the density of water
- ○ **C)** the Coriolis Effect
- ○ **D)** the wind speed across the surface

7) An increase in ocean salinity can change _____ and create a current.

- **A)** the temperature near the poles
- **B)** the density of water
- **C)** the Coriolis Effect
- **D)** the wind speed across the surface

8) Which of the following occurs when wind blows across the ocean's surface, pushing water away from an area?

- **A)** upwelling
- **B)** surface current
- **C)** density current
- **D)** salinity current

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Atmospheric and oceanic circulation

Why does air flow? Because of the differences in air pressure.

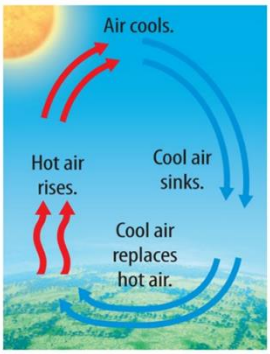
لماذا يتدفق الهواء؟ بسبب الاختلافات في ضغط الهواء

Wind: is the movement of air from areas of high pressure to areas of low pressure.

الرياح: هي حركة الهواء من مناطق الضغط العالي إلى مناطق الضغط المنخفض

- The Sun's energy warms Earth unevenly.

تعمل طاقة الشمس على تدفئة الأرض بشكل غير متساو



- Warm air rises and puts less pressure on Earth than cooler air.

يرتفع الهواء الدافئ ويخضع ضغطًا أقل على الأرض مقارنةً بالهواء البارد

- Cold air sinks and puts more pressure on Earth.

يغرق الهواء البارد ويزيد الضغط على الأرض

These differences in temperature create differences in air pressure, creating both local and global winds.

تخلق هذه الاختلافات في درجات الحرارة اختلافات في ضغط الهواء ، مما يؤدي إلى حدوث رياح محلية وعالمية

What patterns do global winds form? ما هي الأنماط التي تشكلها الرياح العالمية

Recall that conduction occurs when the atmosphere contacts Earth.

تذكر أن التوصيل يحدث عندما يتصل الغلاف الجوي بالأرض

As molecules of air close to Earth's surface are heated by conduction, they spread apart, and the air becomes less dense. Less dense air rises, transferring thermal energy to higher altitudes.

عندما يتم تسخين جزيئات الهواء القريبة من سطح الأرض عن طريق التوصيل ، فإنها تتباعد ، ويصبح الهواء أقل كثافة. يرتفع الهواء الأقل كثافة ، وينقل الطاقة الحرارية إلى ارتفاعات أعلى

This process is called **CONVECTION**

Convection: the transfer of thermal energy by the movement of particles within matter.

الحمل الحراري: نقل الطاقة الحرارية بحركة الجسيمات داخل المادة

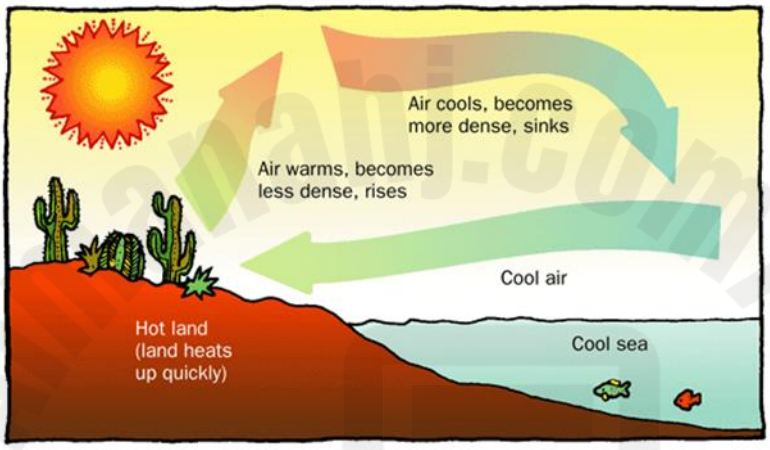
To summarize!!

- Is the way in which heat is transferred through fluids (liquids and gases) by the movement of particles themselves

هي الطريقة التي تنتقل بها الحرارة عبر السوائل (السوائل والغازات) بحركة الجسيمات نفسها

- When particles are heated they expand and get less dense and rise; the cooler the particles get they contact to become more dense and sink.

عندما يتم تسخين الجسيمات فإنها تتمدد وتصبح أقل كثافة وترتفع. كلما زادت برودة تلامس الجسيمات تصبح أكثر كثافة وتغرق



Global winds types:

1. **The polar easterlies:** are cold winds that blow from east to west near the North Pole and the South Pole. Polar easterlies begin as dense polar air that sinks.

الرياح القطبية الشرقية: رياح باردة تهب من الشرق إلى الغرب بالقرب من القطب الشمالي والقطب الجنوبي. تبدأ الأعاصير القطبية على شكل هواء قطبي كثيف يغوص

2. **The prevailing westerlies**: are steady winds that flow from west to east between latitudes 30°N and 60°N, and 30's and 60'S

الرياح الغربية السائدة: هي رياح ثابتة تتدفق من الغرب إلى الشرق بين خطي عرض 30 درجة شمالاً و 60 درجة شمالاً و 30 و 60 درجة جنوبا.

3. **The trade winds:** are steady winds that flow from east to west between 30 N latitude and 30'S latitude.

الرياح التجارية: رياح ثابتة تتدفق من الشرق إلى الغرب بين خط عرض 30 شمالاً وخط عرض 30 درجة جنوبا

Why do the major wind systems blow in certain directions? لماذا تهب أنظمة الرياح الرئيسية في اتجاهات معينة

Because of: بسبب

1. **Earth's rotation** دوران الارض

2. **Coriolis effect**

Coriolis effect: when Earth's rotation causes moving air and water to appear to curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

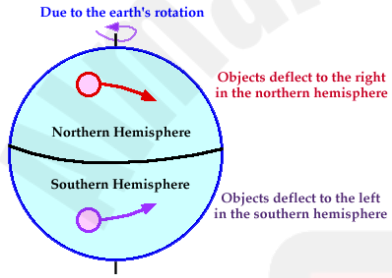
تأثير كوريوليس: عندما يتسبب دوران الأرض في انحناء الهواء والماء المتحركين إلى اليمين في نصف الكرة الشمالي وإلى اليسار في نصف الكرة الجنوبي

- The coriolis effect describes how objects and fluid matter, like air and water, move in an apparent curved path rather than a straight line.

يصف تأثير كوريوليس كيفية تحرك الأشياء والمواد السائلة ، مثل الهواء والماء ، في مسار منحني ظاهر بدلاً من خط مستقيم

- It is the coriolis effect that produces the curving patterns of circulating wind.

إن تأثير كوريوليس هو الذي ينتج أنماط الانحناء للرياح المنتشرة



3. **Effect of Landmasses** تأثير الكتل اليابسة

The Coriolis effect is not the only factor that influences the motion of wind Landmasses also affect the speed and direction of wind systems.

تؤثر الكتل الأرضية أيضًا على سرعة واتجاه أنظمة الرياح, تأثير كوريوليس ليس هو العامل الوحيد الذي يؤثر على حركة الرياح

For example على سبيل المثال

- The westerlies in the Southern Hemisphere are locally very strong because this system is mostly over the oceans and has few continents to disrupt the wind.

تعتبر المناطق الغربية في النصف الجنوبي من الكرة الأرضية قوية جدًا محليًا لأن هذا النظام يقع في الغالب فوق المحيطات ولديه عدد قليل من القارات لتعطيل الرياح

- When wind meets a large feature, such as a mountain, it is deflected, or forced, upward.

عندما تلتقي الرياح بميزة كبيرة ، مثل الجبل ، فإنها تنحرف أو تضطر إلى أعلى

Why does ocean water flow? لماذا تتدفق مياه المحيط

The uneven heating of Earth has an effect on ocean water that is similar to its effect on air. It causes differences in physical properties that cause ocean water to flow.

يؤثر التسخين غير المتكافئ للأرض على مياه المحيطات بشكل مشابه لتأثيرها على الهواء. يسبب اختلافات في الخصائص الفيزيائية التي تسبب تدفق مياه المحيط.

Water flow is caused and affected by the following factors:

1. **Density Current**

Density current: the vertical movement of water caused by differences in density.

تيار الكثافة: هو الحركة العمودية للماء الناتجة عن اختلافات في الكثافة

What causes the density current? ما سبب كثافة التيار

- High salinity and cold temperatures cause water to become more dense.

تؤدي الملوحة العالية ودرجات الحرارة الباردة إلى زيادة كثافة الماء

- This helps create currents of water deep in the ocean as water flows from areas of high density to areas of low density.

يساعد هذا في تكوين تيارات مائية في أعماق المحيط حيث تتدفق المياه من مناطق ذات كثافة عالية إلى مناطق منخفضة الكثافة

2. **Surface Current**

Surface current: a wind-driven current that carries ocean water horizontally across the ocean's surface.

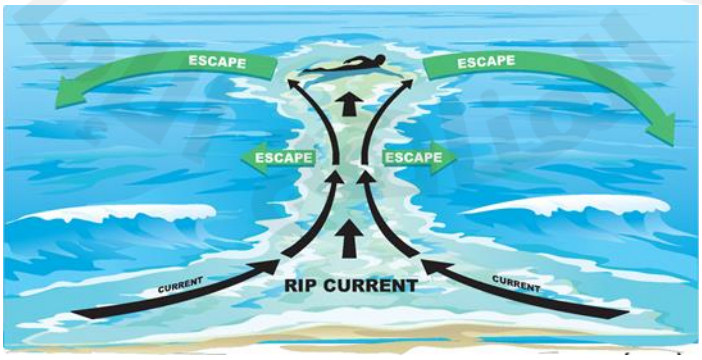
التيار السطحي: تيار تحركه الرياح يحمل مياه المحيط أفقياً عبر سطح المحيط

- As the wind blows over ocean water, it transfers energy to the water. The moving air particles drag on the surface of the water and cause the top portion of the ocean to move.

عندما تهب الرياح فوق مياه المحيط ، فإنها تنقل الطاقة إلى الماء. تسحب جزيئات الهواء المتحركة سطح الماء وتتسبب في تحرك الجزء العلوي من المحيط

- Surface currents move toward the poles, they cool and sink.

تتحرك التيارات السطحية نحو القطبين ، فتبرد وتغرق



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3. Upwelling

Upwelling: is the vertical movement of water toward the ocean's surface.

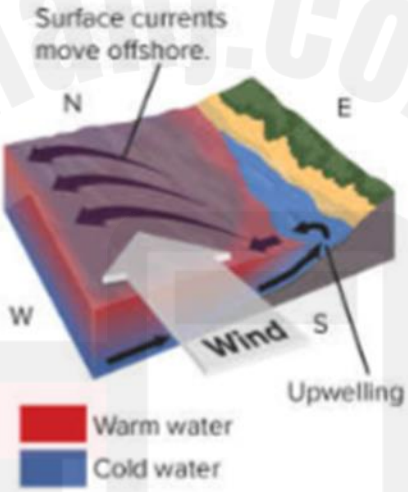
الموجات الصاعدة: هي الحركة العمودية للمياه باتجاه سطح المحيط

- As the wind blows over ocean water, it transfers energy to the water. The moving air particles drag on the surface of the water and cause the top portion of the ocean to move.

عندما تهب الرياح فوق مياه المحيطات ، فإنها تنقل الطاقة إلى الماء. تسحب جزيئات الهواء المتحركة سطح الماء وتتسبب في تحرك الجزء العلوي من المحيط

- Upwelling occurs when the wind blows across the ocean's surface and pushes water away from an area. Deeper, colder water is then forced to the surface.

يحدث الارتفاعات الصاعدة عندما تهب الرياح عبر سطح المحيط وتدفع المياه بعيدًا عن منطقة ما. ثم يتم دفع المياه الأعمق والأبرد إلى السطح



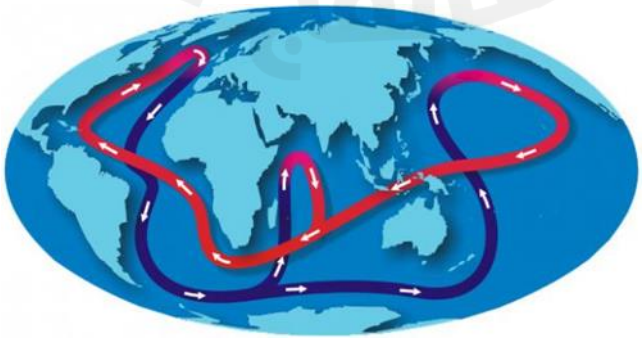
What global pattern do ocean currents form? ما هو النمط العالمي الذي تشكله تيارات المحيطات

- Surface currents, upwelling, and density currents combine to form <u>THE GREAT OCEAN CONVEYER BELT.</u>

تتحد التيارات السطحية وتيارات المياه المتدفقة والكثافة لتشكل حزام النقل المحيط العظيم

- Variations in temperature and salinity drive this global pattern of interconnected ocean currents.

تؤدي الاختلافات في درجات الحرارة والملوحة إلى هذا النمط العالمي لتيارات المحيط المترابطة



Questions

Question 1: Cool air creates what type of pressure?

- Low pressure
- Medium pressure
- High pressure

Question 2: Warm air creates what type of pressure?

- Low pressure
- Medium pressure
- High pressure

Question 3: Cool air……

- Rises
- Sinks
- Generally does not move

Question 4: Warm air……

- Rises
- Sinks
- Generally does not move

Question 5: Wind is caused mainly by air pressure differences that result from.....

- Uneven heating of the Earth's atmosphere.
- Absorption of ultraviolet radiation by Earth's landmasses.
- Radiation of heat from Earth's landmasses to water bodies.
- Rotation of Earth on its axis.

Question 6: Which statement correctly defines wind?

- Wind is the movement of air from areas of low pressure to areas of high pressure
- Wind is the movement of air to a colder area in the atmosphere.
- Wind is the movement of air from areas of high pressure to areas of low pressure.
- Wind is the movement of air pushed around and bouncing off Earth's surface.

Question 7: What causes global winds and convection in the atmosphere?

- Continental deflection
- The rotation of the earth
- Moon's gravity
- Unequal heating of the earth by the sun

Question 8: The heat source for convection in the atmosphere is the:

- Core
- Water
- Land
- Sun

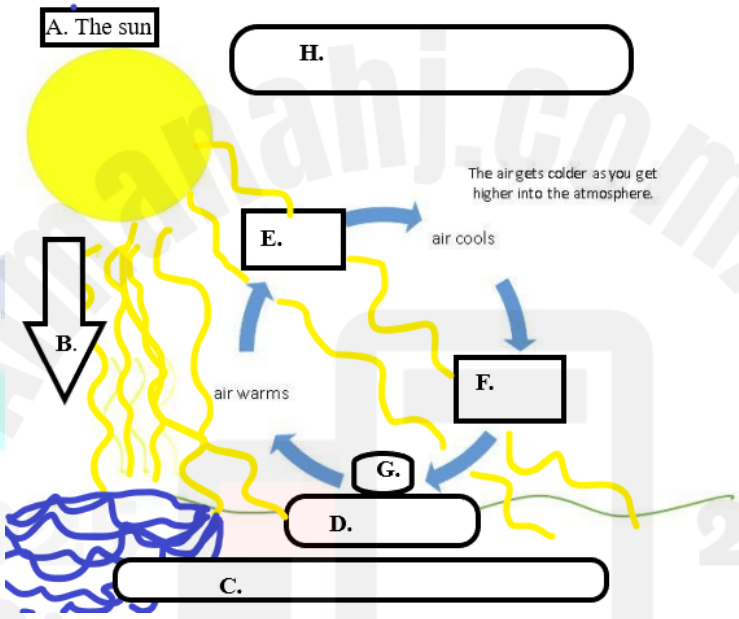
Question 9: Convection in the atmosphere is caused by the rotation of the Earth on its axis

- True
- False

Question 10: What two properties cause convection? (You can choose two answers)

- Temperature
- Mass
- Density
- Electricity

Answer questions 11, 12, 13 and 14 based on the following picture



Question 11: At which point on the diagram does the air cool, sink and become more dense?

- Point E
- Point F
- Point H
- None of the above.

Question 12: What is occurring at point E on the diagram?

- The Earth is absorbing the sun's radiation.
- The air has risen because it picked up heat, becoming more dense.
- The air has risen because it picked up heat, becoming less dense.
- The air is sinking because it has cooled becoming less dense.

Question 13: Find point D. on the diagram. Heat is transferred to the air when the air touches the ground through _____.

- Convection
- Radiation
- Conduction
- Temperature

Question 14: Which title would best fit the diagram at Point H?

- The Sun.
- Water Cycle.
- Convection Currents in the Atmosphere.
- None of the above.

Question 15: Objects in the NORTHERN Hemisphere deflect to which direction due to the Coriolis Effect?

- Left.
- Up.
- Down.
- Right.

Question 16: The coriolis effect is caused by what?

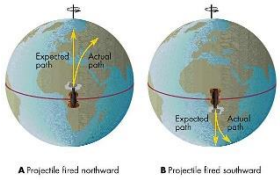
- The wind blowing
- Earth's gravity pulling things down
- The rotation of the Earth
- The pull of the Moon

Question 17: The Coriolis effect causes _____.

- The Earth rotates on its axis
- Earthquakes
- Air and water to move in a curved path instead of a straight line
- The Earth to revolve around the sun

Question 18: The curving of air to the right in the Northern hemisphere is caused by _____ and is called the _____ effect.

- Earth's rotation...Coriolis
- Earth's revolution...Coriolis
- Earth's rotation...Doppler
- Earth's revolution...Doppler



Question 19: What impact does the Coriolis effect have upon winds in the northern and southern hemispheres?

- Winds blow counterclockwise in the northern hemisphere and clockwise in the southern hemisphere.
- Winds blow clockwise in the northern hemisphere and counterclockwise in the southern hemisphere.
- Winds flow clockwise in both the northern and southern hemispheres.
- The coriolis effect has no impact upon winds in the northern and southern hemispheres.

Question 20: The transfer of thermal energy by the movement of particles within matter is called:

- Conduction
- Radiation
- Convection

Question 21: What is the factor that influencing the movement of wind

- Earth rotation
- Landmasses
- Cariolis effect
- All above

Question 22: Which of these choices is densest and would sink to the bottom?

- Warm, fresh water
- Cold, fresh water
- Warm, salt water
- Cold, salt water

Question 23: What is the major cause of surface currents?

- Dolphins
- Wind
- Hurricanes
- Tides

Question 24: Where is ocean water the densest?

- The surface
- The middle
- The bottom
- Lake Michigan

Question 26: Temperature and salinity differences in ocean water cause:

- Mid-ocean ridges
- Density Currents
- Surface Currents
- High tide and low tide

Question 27: As you go deeper in the ocean, the water is colder and less salty.

- True.
- False.

Question 28: A horizontal movement of ocean water that is caused by wind and that occurs at or near the ocean's surface. This is the definition of:

- Gulf Stream
- Global Conveyor Belt
- Surface Current
- Gyre

Question 29: Is the vertical movement of water toward the ocean's surface. This is the definition of:

- Gulf Stream
- Upwelling
- Surface Current
- Gyre

Question 30: Deep ocean current caused by temperature and density that moves water around the world. This is the definition of:

- California current
- Gulf Stream
- Gyres
- Global conveyor belt