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Scientists use windows to trap solar energy

http://www.breakingnewsenglish.com/0807/080714-solar_energy.html

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THE ARTICLE

Researchers from the Massachusetts Institute of Technology (MIT) have discovered a new way of capturing the Sun's energy. A team from MIT have created a new technique that involves coating windows with special chemical dyes. The dyes help trap the light from the Sun and send it to special storage cells that then convert the light into electricity. The team's discovery could transform buildings into energy plants. It could even one day mean that the windows in our houses could power our homes. The scientists say their dyes can produce ten times more power than the traditional solar panels used around the world today. They predict that this clean and renewable energy technology could be available within the next three years.

The idea was first developed in the 1970s but was abandoned. Scientists then found that too much of the collected sunlight failed to reach the solar storage units at the edges of the window. The MIT engineers revived the idea and used coloured dyes to stop the light from escaping. MIT's development also does away with the need for hundreds of bulky solar cells. Instead, their method only requires cells around the edges of the window. MIT's Professor Baldo explained: "The coated glass would let through about 10 per cent of the Sun to light up the room, and the remainder would be captured and funnelled to the edges to solar cells to generate electricity...It would look like smoked glass because of the dyes." The new discovery could help fight climate change.

WARM-UPS

1. SOLAR ENERGY: Walk around the class and talk to other students about solar energy. Change partners often. After you finish, sit with your partner(s) and share your findings.

2. CHAT: In pairs / groups, decide which of these topics or words from the article are most interesting and which are most boring.

researchers / discoveries / the Sun / energy / windows / light / electricity / power / sunlight / engineers / solar cells / smoked glass / climate change

Have a chat about the topics you liked. Change topics and partners frequently.

3. HOME POWER: How can scientists make your home fight climate change? With your partner(s), think of how scientists could make the things in the table create or save energy. Change partners and share your ideas. Vote on the best ideas.

Things	Create energy	Save energy
Windows		
Carpets		
Walls		
Garden		
Roof		
Other _____		

4. RENEWABLES: Which of these renewable sources of energy do you think are good? Rate them: 10 = "This will save the planet"; 1 = "Not a whole lot of good". Talk with your partner(s) about how they relate to your country.

- | | |
|----------------------|----------------------------|
| _____ solar energy | _____ hydro-electric power |
| _____ wind power | _____ biofuels |
| _____ tidal (wave) | _____ converted waste |
| _____ thermal energy | _____ rain |

5. HEADLINE PREDICTION: With your partner(s), use the words in the "Chat" activity above to predict what the news article will be about. Once you have your story, change partners and share them. Who was closest to the real story?

6. DYE: Spend one minute writing down all of the different words you associate with the word 'dye'. Share your words with your partner(s) and talk about them. Together, put the words into different categories.

BEFORE READING / LISTENING

1. TRUE / FALSE: Look at the article's headline and guess whether these sentences are true (T) or false (F):

- a. A team of researchers have found a way of trapping the Sun's energy. T / F
- b. The new technique uses windows that are painted with a special dye. T / F
- c. The dyes could also be used to get energy from plants. T / F
- d. This new technology won't be available for at least three years. T / F
- e. This idea is around thirty years old. T / F
- f. Coloured dyes on the window help stop light from escaping. T / F
- g. Ten percent of the Sun's light is captured and stored in special cells. T / F
- h. The new technology could be used in the fight against climate change. T / F

2. SYNONYM MATCH: Match the following synonyms from the article:

- | | |
|---------------|-----------------|
| 1. discovered | a. rest |
| 2. capturing | b. change |
| 3. coating | c. brought back |
| 4. convert | d. catching |
| 5. predict | e. channelled |
| 6. abandoned | f. forecast |
| 7. revived | g. big |
| 8. bulky | h. found |
| 9. remainder | i. dropped |
| 10. funnelled | j. covering |

3. PHRASE MATCH: Match the following phrases from the article (sometimes more than one combination is possible):

- | | |
|--|--------------------------------------|
| 1. a new way of capturing | a. to reach the solar storage units |
| 2. coating windows | b. the light from the Sun |
| 3. The dyes help trap | c. 1970s but was abandoned |
| 4. the windows in our houses could | d. about 10 per cent of the Sun |
| 5. clean and | e. the Sun's energy |
| 6. The idea was first developed in the | f. for hundreds of bulky solar cells |
| 7. too much of the collected sunlight failed | g. renewable energy |
| 8. does away with the need | h. climate change |
| 9. The coated glass would let through | i. with special chemical dyes |
| 10. The new discovery could help fight | j. power our homes |

WHILE READING / LISTENING

GAP FILL: Put the words into the gaps in the text.

Researchers from the Massachusetts Institute of Technology (MIT) have discovered a new _____ of capturing the Sun's energy. A team from MIT have created a new technique that _____ coating windows with special chemical dyes. The dyes help trap the light from the Sun and _____ it to special storage cells that then _____ the light into electricity. The team's discovery could transform buildings into energy _____. It could even one day mean that the windows in our houses could _____ our homes. The scientists say their dyes can produce ten _____ more power than the traditional solar panels used around the world today. They predict that this clean and renewable energy technology could be _____ within the next three years.

times
plants
send
available
way
convert
involves
power

The idea was _____ developed in the 1970s but was abandoned. Scientists then found that too much of the collected sunlight _____ to reach the solar storage units at the edges of the window. The MIT engineers revived the _____ and used coloured dyes to stop the light from escaping. MIT's development also does away with the _____ for hundreds of bulky solar cells. Instead, their method only requires cells around the _____ of the window. MIT's Professor Baldo explained: "The coated glass would let through about 10 per cent of the Sun to _____ up the room, and the remainder would be captured and funnelled to the edges to solar cells to _____ electricity...It would look like smoked glass because of the dyes." The new discovery could help _____ climate change.

generate
idea
edges
fight
first
light
failed
need

LISTENING: Listen and fill in the spaces.

Researchers from the Massachusetts Institute of Technology (MIT) have discovered _____ capturing the Sun's energy. A team from MIT have created a new technique _____ coating windows with special chemical dyes. The dyes _____ light from the Sun and send it to special storage cells that then convert the light into electricity. The team's discovery could transform buildings into _____. It could even one day mean that the windows in our houses _____ our homes. The scientists say their dyes can produce ten times more power than the traditional solar panels _____ the world today. They predict that this clean and renewable energy technology could _____ within the next three years.

The _____ developed in the 1970s but was abandoned. Scientists then found that too much of the collected sunlight _____ the solar storage units _____ the window. The MIT engineers revived the idea and used coloured dyes to stop _____ escaping. MIT's development also _____ the need for hundreds of bulky solar cells. Instead, their _____ requires cells around the edges of the window. MIT's Professor Baldo explained: "The coated glass would let through about 10 per cent of the Sun to light up the room, and the remainder _____ and funnelled to the edges to solar cells to generate electricity...It would look like smoked glass because of the dyes." The new discovery _____ climate change.

AFTER READING / LISTENING

1. WORD SEARCH: Look in your dictionaries / computer to find collocates, other meanings, information, synonyms ... for the words 'solar' and 'energy'.

solar	energy
--------------	---------------

- Share your findings with your partners.
- Make questions using the words you found.
- Ask your partner / group your questions.

2. ARTICLE QUESTIONS: Look back at the article and write down some questions you would like to ask the class about the text.

- Share your questions with other classmates / groups.
- Ask your partner / group your questions.

3. GAP FILL: In pairs / groups, compare your answers to this exercise. Check your answers. Talk about the words from the activity. Were they new, interesting, worth learning...?

4. VOCABULARY: Circle any words you do not understand. In groups, pool unknown words and use dictionaries to find their meanings.

5. TEST EACH OTHER: Look at the words below. With your partner, try to recall how they were used in the text:

<ul style="list-style-type: none">• way• dyes• convert• plants• homes• three	<ul style="list-style-type: none">• 1970s• failed• escaping• bulky• 10%• smoked
---	--

STUDENT SOLAR ENERGY SURVEY

Write five GOOD questions about solar energy in the table. Do this in pairs. Each student must write the questions on his / her own paper.

When you have finished, interview other students. Write down their answers.

	STUDENT 1 _____	STUDENT 2 _____	STUDENT 3 _____
Q.1.			
Q.2.			
Q.3.			
Q.4.			
Q.5.			

- Now return to your original partner and share and talk about what you found out. Change partners often.
- Make mini-presentations to other groups on your findings.

SOLAR ENERGY DISCUSSION

STUDENT A's QUESTIONS (Do not show these to student B)

- a) What did you think when you read the headline?
- b) What springs to mind when you hear the term 'solar energy'?
- c) What do you think of the new discovery?
- d) How much of a difference do you think this new discovery might make?
- e) Do you think solar power offers the best source of renewable energy?
- f) Do you think this idea will catch on and take off?
- g) How energy efficient is your house?
- h) Do you think the new dye will only be useful in hot countries?
- i) Could this be the end for oil companies?
- j) How much would you pay to have the dyed windows put in your house?

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SOLAR ENERGY DISCUSSION

STUDENT B's QUESTIONS (Do not show these to student A)

- a) Did you like reading this article?
- b) Do discoveries like this fill you with hope for the future?
- c) Do you think scientists will one day find solutions to all of our energy problems?
- d) Have you ever thought about getting solar panels on your house?
- e) Do you think governments are trying hard enough to find alternative sources of energy?
- f) Are you satisfied with how "green" your country is?
- g) Would you like to be an MIT researcher?
- h) What three adjectives would you use to describe the Sun?
- i) Do you have any ideas how other parts of our homes could create energy?
- j) What questions would you like to ask Professor Baldo?

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LANGUAGE

Researchers from the Massachusetts Institute of Technology (MIT) have discovered a new way of capturing the (1) ____ energy. A team from MIT have created a new technique that involves coating windows (2) ____ special chemical dyes. The dyes help trap the light from the Sun and send it to special storage cells that then convert the light (3) ____ electricity. The team's discovery could transform buildings into energy (4) _____. It could even one day mean that the windows in our houses could power our homes. The scientists say their dyes can produce ten times more power than the traditional solar panels (5) ____ around the world today. They predict that this clean and (6) ____ energy technology could be available within the next three years.

The idea was first developed in the 1970s but was (7) _____. Scientists then found that too much of the collected sunlight (8) ____ to reach the solar storage units at the edges of the window. The MIT engineers revived the idea and used coloured dyes to stop the light (9) ____ escaping. MIT's development also (10) ____ away with the need for hundreds of bulky solar cells. Instead, their method only requires cells around the edges of the window. MIT's Professor Baldo explained: "The coated glass would let through about 10 per cent of the Sun to light (11) ____ the room, and the remainder would be captured and funnelled to the edges to solar cells to (12) ____ electricity...It would look like smoked glass because of the dyes." The new discovery could help fight climate change.

Put the correct words from the table below in the above article.

- | | | | | |
|-----|--------------|---------------|---------------|----------------|
| 1. | (a) sun's | (b) suns' | (c) Suns' | (d) Sun's |
| 2. | (a) with | (b) for | (c) by | (d) to |
| 3. | (a) by | (b) into | (c) for | (d) as |
| 4. | (a) flowers | (b) trees | (c) plants | (d) bushes |
| 5. | (a) using | (b) use | (c) used | (d) users |
| 6. | (a) renewing | (b) renewable | (c) renew | (d) renews |
| 7. | (a) burned | (b) banished | (c) banned | (d) abandoned |
| 8. | (a) failed | (b) failure | (c) fails | (d) failing |
| 9. | (a) with | (b) from | (c) to | (d) for |
| 10. | (a) gives | (b) goes | (c) makes | (d) does |
| 11. | (a) down | (b) in | (c) up | (d) out |
| 12. | (a) generate | (b) generator | (c) generates | (d) generating |

HOMework

1. VOCABULARY EXTENSION: Choose several of the words from the text. Use a dictionary or Google's search field (or another search engine) to build up more associations / collocations of each word.

2. INTERNET: Search the Internet and find out more about the MIT discovery. Share what you discover with your partner(s) in the next lesson.

3. RENEWABLES: Make a poster about the different kinds of renewable energies scientists are working on. Show your work to your classmates in the next lesson. Did you all have similar things?

4. THE FUTURE: Write a magazine article about how we will get power in the future. Include imaginary interviews with a 21st Century person and a 25th Century person.

Read what you wrote to your classmates in the next lesson. Write down any new words and expressions you hear from your partner(s).

5. DIARY / JOURNAL: Record the energy you use in one day. Write your thoughts on how you could reduce this. Read your entry to your classmates in the next lesson.

6. LETTER: Write a letter to the head of your government. Ask him/her three questions about his/her renewable energy policies. Give him/her three pieces of advice on what she/he should do to combat climate change. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.

ANSWERS

TRUE / FALSE:

- a. T b. T c. F d. F e. T f. T g. F h. T

SYNONYM MATCH:

- | | | | |
|-----|------------|----|--------------|
| 1. | discovered | a. | found |
| 2. | capturing | b. | catching |
| 3. | coating | c. | covering |
| 4. | convert | d. | change |
| 5. | predict | e. | forecast |
| 6. | abandoned | f. | dropped |
| 7. | revived | g. | brought back |
| 8. | bulky | h. | big |
| 9. | remainder | i. | rest |
| 10. | funnelled | j. | channelled |

PHRASE MATCH:

- | | | | |
|-----|---|----|-----------------------------------|
| 1. | a new way of capturing | a. | the Sun's energy |
| 2. | coating windows | b. | with special chemical dyes |
| 3. | The dyes help trap | c. | the light from the Sun |
| 4. | the windows in our houses could | d. | power our homes |
| 5. | clean and | e. | renewable energy |
| 6. | The idea was first developed in the | f. | 1970s but was abandoned |
| 7. | too much of the collected sunlight failed | g. | to reach the solar storage units |
| 8. | does away with the need | h. | for hundreds of bulky solar cells |
| 9. | The coated glass would let through | i. | about 10 per cent of the Sun |
| 10. | The new discovery could help fight | j. | climate change |

GAP FILL:

Scientists use windows to trap solar energy

Researchers from the Massachusetts Institute of Technology (MIT) have discovered a new **way** of capturing the Sun's energy. A team from MIT have created a new technique that **involves** coating windows with special chemical dyes. The dyes help trap the light from the Sun and **send** it to special storage cells that then **convert** the light into electricity. The team's discovery could transform buildings into energy **plants**. It could even one day mean that the windows in our houses could **power** our homes. The scientists say their dyes can produce ten **times** more power than the traditional solar panels used around the world today. They predict that this clean and renewable energy technology could be **available** within the next three years.

The idea was **first** developed in the 1970s but was abandoned. Scientists then found that too much of the collected sunlight **failed** to reach the solar storage units at the edges of the window. The MIT engineers revived the **idea** and used coloured dyes to stop the light from escaping. MIT's development also does away with the **need** for hundreds of bulky solar cells. Instead, their method only requires cells around the **edges** of the window. MIT's Professor Baldo explained: "The coated glass would let through about 10 per cent of the Sun to **light** up the room, and the remainder would be captured and funnelled to the edges to solar cells to **generate** electricity...It would look like smoked glass because of the dyes." The new discovery could help **fight** climate change.

LANGUAGE WORK

- 1 - d 2 - a 3 - b 4 - c 5 - c 6 - b 7 - d 8 - a 9 - b 10 - d 11 - c 12 - a