PREVENTING PREVENTABLE TRACKING:

THE PERIL AND PROMISE FOR LOWER ENGLISH PROFICIENT STUDENTS

Rebecca Kopriva, University of Wisconsin

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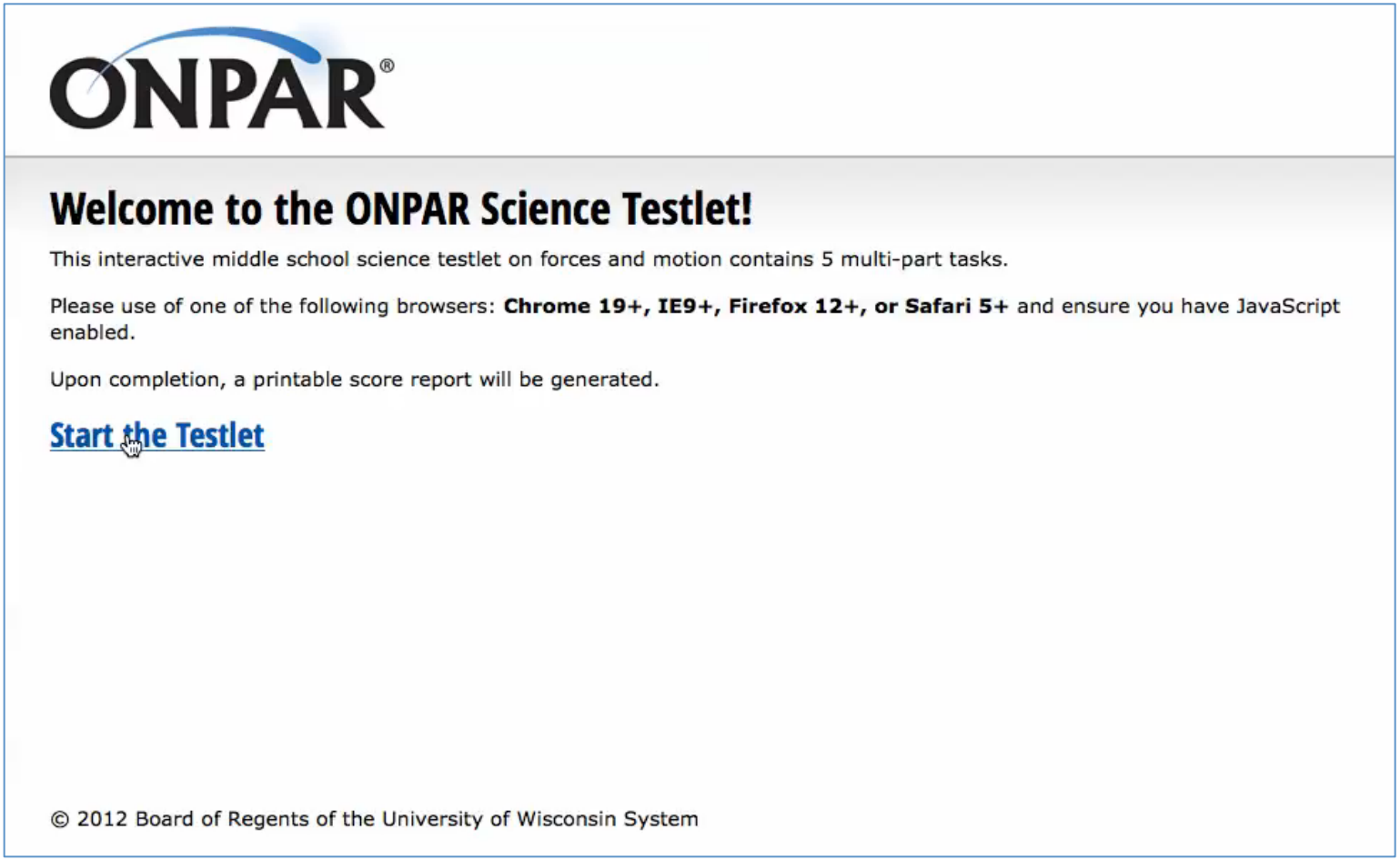
Embrace the spirit of ECD…

And of OCR….

Distorted, depressed scores of low English proficient students on large-scale academic tests early on likely leads to tracking in low, remedial classes…

(Gandara, 2009, and others)

Demonstration: ONPAR Middle School Science Testlet



What is ONPAR?

- An assessment methodology employing innovative computer-interactive features designed to increase access to content testing for students with language and literacy difficulties.
- ONPAR uses many of the same features of current approaches (e.g., visuals, animations, audio support, and formatting considerations) but applies techniques in a a novel way.
- In ONPAR, the role of written text as the primary way of conveying meaning to and from students on assessment tasks is deliberately reversed almost everywhere.
- Instead, most written text assumes an auxiliary role while computer-interactive techniques largely redirect the language comprehension and production loads to multi-semiotic representations.
- The item questions use written text in full sentences with visuals as supports.

Why Multi-Semiotic Representations?

Properly constructed, multi-semiotic methods can

- Broaden how students are allowed to respond.
- Broaden how we present the problems.
- Broaden our understanding of how students conceptualize knowledge and use skills.

Most often it is best if multiple avenues of access are built into each of the tasks at each of these points.

Why ONPAR?

Students with literacy and language challenges **ARE** learning complex content.

They and their teachers have learned to convey meaning using modes other than text as primary communication methods, supported by key language as needed.

This means successful adaptations need to include ways to:

- convey meaning *to* the student
- convey meaning *from* the student

These adaptations appear useful for other students as well – may yield a more direct measure of latent construct for complex tasks that typically require more dense text.

Does it 'Work'?
ONPAR Studies to Date

Projects	Forms / Studies	Focal Groups
4th and 8th Grade Science (2009)	ONPAR/Traditional ~50 cog labs Experimental study	Native English speakers, Lower English-proficient ELs and exploratory for Mid- and High-level ELs
4th and 7th grade Mathematics (2011)	ONPAR/Traditional ~50 cog labs Experimental study	Non-IEP Students, Students with Learning disabilities (LD), Other Students with Disabilities (Other SwD)
High School Biology and Chemistry (2012)	ONPAR/ Technology-Enhanced Traditional (TET) ~50 cog labs Experimental study	Native English speakers with no IEPs, ELs, LDs, Other SwD,

Summary of Some ONPAR Findings Across Studies

1. Evidence of differential boost for focal groups across all studies: Focal students performed better on ONPAR versus traditional as compared to controls

2. Results suggest focal students are learning challenging content but traditional assessment tasks may not be eliciting evidence of this

3. Results for the Other SWD group (in mathematics and HS biology, and chemistry) suggest ONPAR approach is beneficial for students with a range of disabilities, not just those explicitly related to language and literacy

Summary of Some ONPAR Findings Across Studies

4. Variation among the types of English learners who showed the most substantial gains on ONPAR vs. traditional task across the grade spans
   - In EI and MS science study, low English-proficient ELs benefited most from ONPAR forms while high ELs performed similarly to the control group on ONPAR.
   - In HS biology, ELs with higher English language proficiency appeared to benefit from the ONPAR approach

How Does It Work?
Some Underpinnings from Cognition Research

1. **Rich Contexts with Narrative Elements** – Opening vignettes and interactive narrative elements draw students into the 'story' of the assessment item, focusing and stimulating prior knowledge structures
   - Multi-semiotic representations facilitate multiple cognitive connections and retrieval paths (e.g., "dual coding").
   - Careful integration of visual and textual elements minimizes split attention and reduces processing demands

How Does It Work?
Some Underpinnings from Cognition Research

2. **Efficient** – Get in and get out: Multimodal, interactive contextual stimuli designed to maximize richness quickly with maximum impact (think of effective ads)

- Briefly conveys a great deal of critical information effectively to minimize processing demands and guide student focus to salient information (ditto with the ads…)
- Standardized locations of screen elements (e.g., Help icons and prompts) 'prime' attention and maximize efficiency of target elements
  - ✓ Visual system highly sensitive to regularities in the search field and thus prioritizes locations that were important during previous viewings

How Does It Work?
Some Underpinnings from Cognition Research

3. **Pacing –** Animations, screen set-ups set a deliberate but not hurried pace
   - Item screens built to facilitate 'chunking'

4. **Additional Attending and Processing Strategies**
   - Opportunities for continuous interaction with screen elements keeps engagement high (e.g., manipulating onscreen supports, moving screen elements to build responses; using sub-tasks for the purpose of focusing attention, not scoring)
   - Autonomy and choices; students customize their experience
   - Built-in redundancies reduce working memory demands
   - Careful attention to foreground and background screen elements so as not to overwhelm (again, ads do this very effectively)

How Does It Work?
Some Underpinnings from Cognition Research

5. Response formats: Lets take a look at a few…

Make a shape that can fold into the prism.

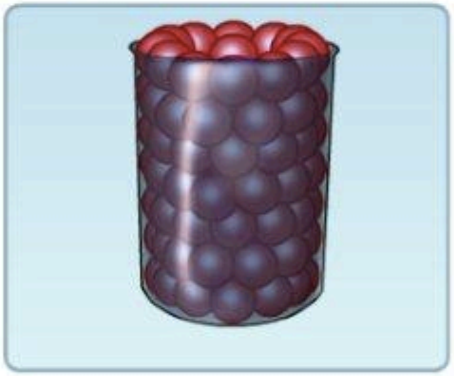
?

?

Question: 1 of 1

Show how to estimate the number of marbles in the jar.

?



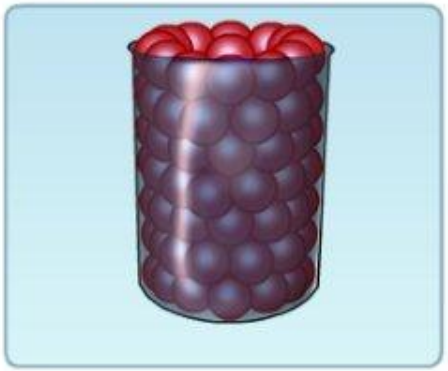
?

GO

Question: 1 of 1

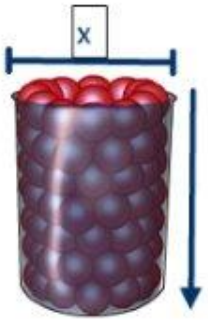
Show how to estimate the number of marbles in the jar.

?



Count the number of marbles on the top of the jar, then multiply by the amount of

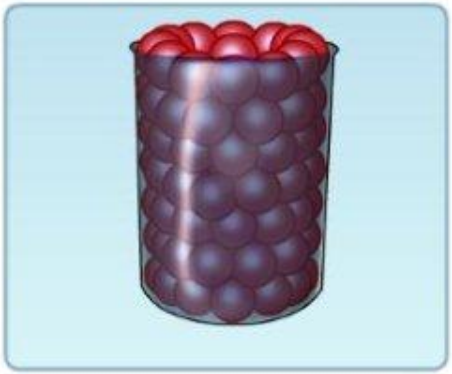
rows of marbles in the jar



GO

Show how to estimate the number of marbles in the jar.

?



12 marbles per layer

6 layers

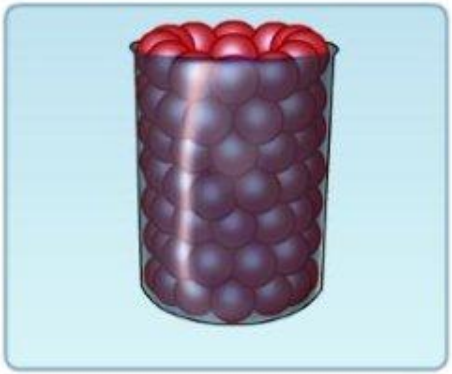
12*6 = 72

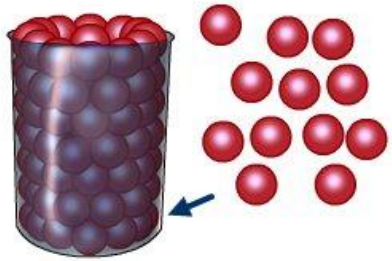
GO

Question: 1 of 1

Show how to estimate the number of marbles in the jar.

?





12 marbles on the bottom row

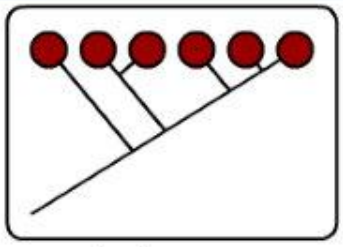
there are about 7 rows in the jar

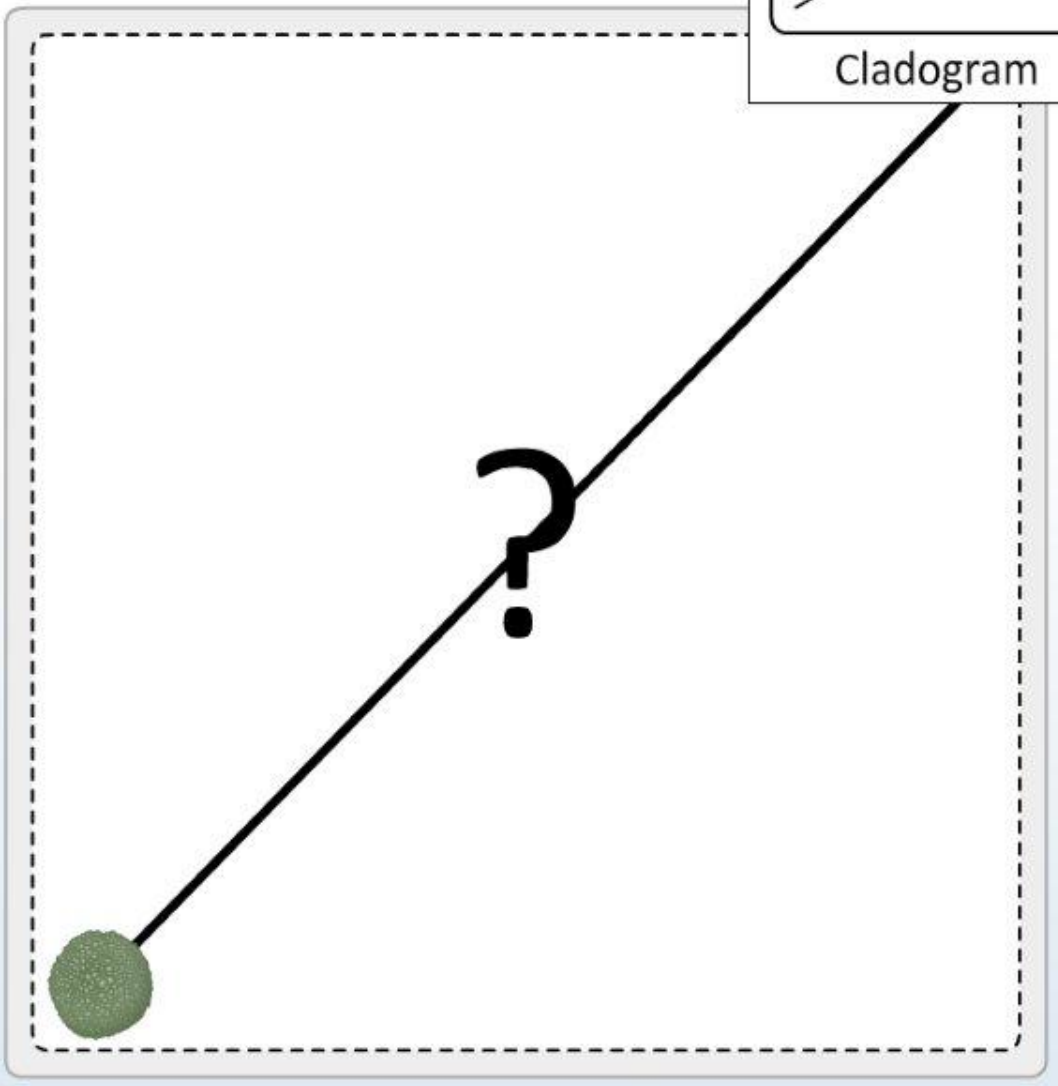
12x7=84 marbles

Use the amino acid differences to make a cladogram for the bacteria.

	Bacteria	Position 11	52	79
Given		W	E	K
New		V	P	R
New		V	E	R
New		W	E	R
New		V	E	R

Cladogram





Scene: 01 of 01

Thank you

Draw the Lewis structures for H_2O, CO_2 and CH_4.

?

H C O

– I

= II

≡ III

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: ··

::

H_2O	CO_2	CH_4
?	?	?

Question: 1 of 1 | Scene: 2 of 3

English

GO

Draw the Lewis structures for H_2O, CO_2 and CH_4.

?

H C O

– I

= II

≡ III

• : ••

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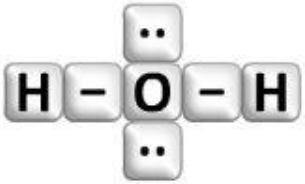
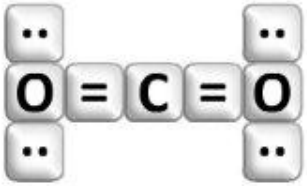
H_2O	CO_2	CH_4
		

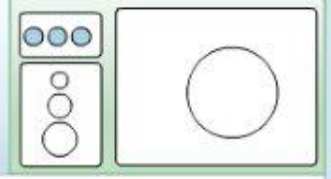
Question: 1 of 1

Scene: 2 of 3

English

GO

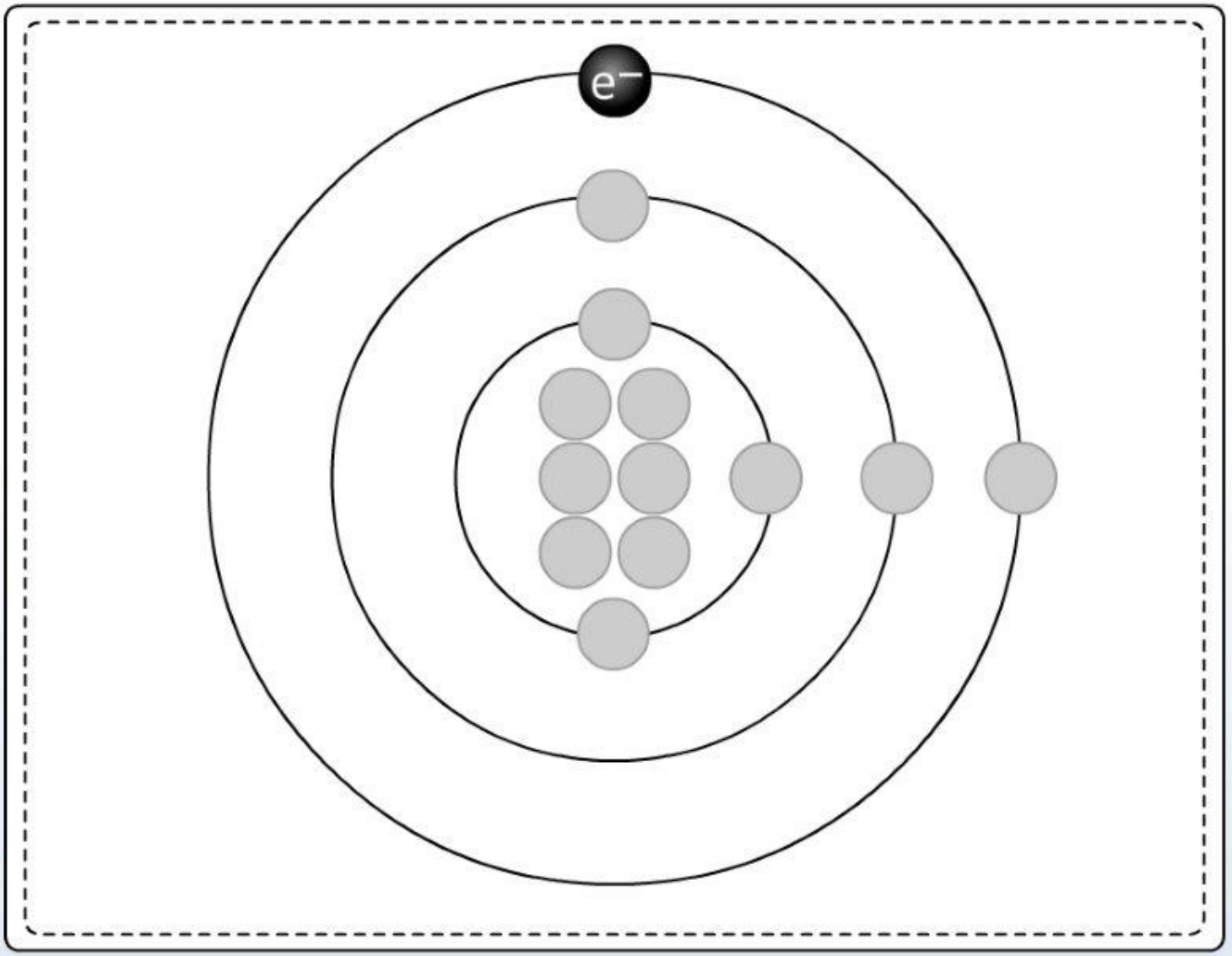
Make a Bohr model of a helium atom.



Particles

Orbits

?


e⁻

Explainyour answer

?

salt

sand

water

filter

absorbs

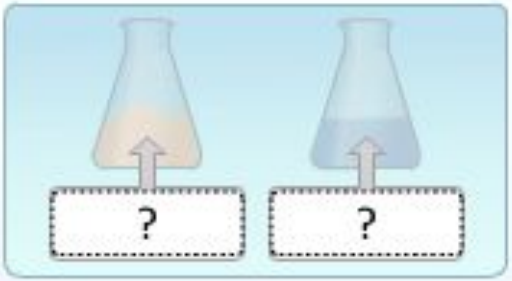
does not absorb

dissolves in

does not dissolve in

floats in

sinks in



Because

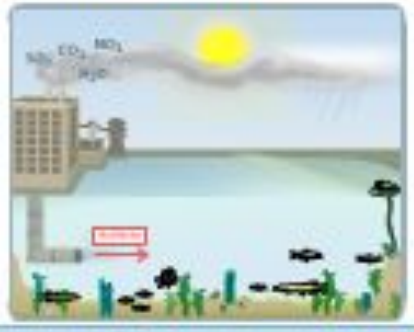
? ? ?

and

? ? ?

Question: 1 of 1

How does the power plant affect the lake ecosystem?



algae | O_2 air
acid water | O_2 water
CO_2 air
CO_2 water
air
water

causes
causes
causes
causes
causes

Question: 1 of 1

For More Information

Website: http://onpar.us

Rebecca Kopriva, rkopriva@wisc.edu

Thank you!