



Data Mining Student Notes and Questions

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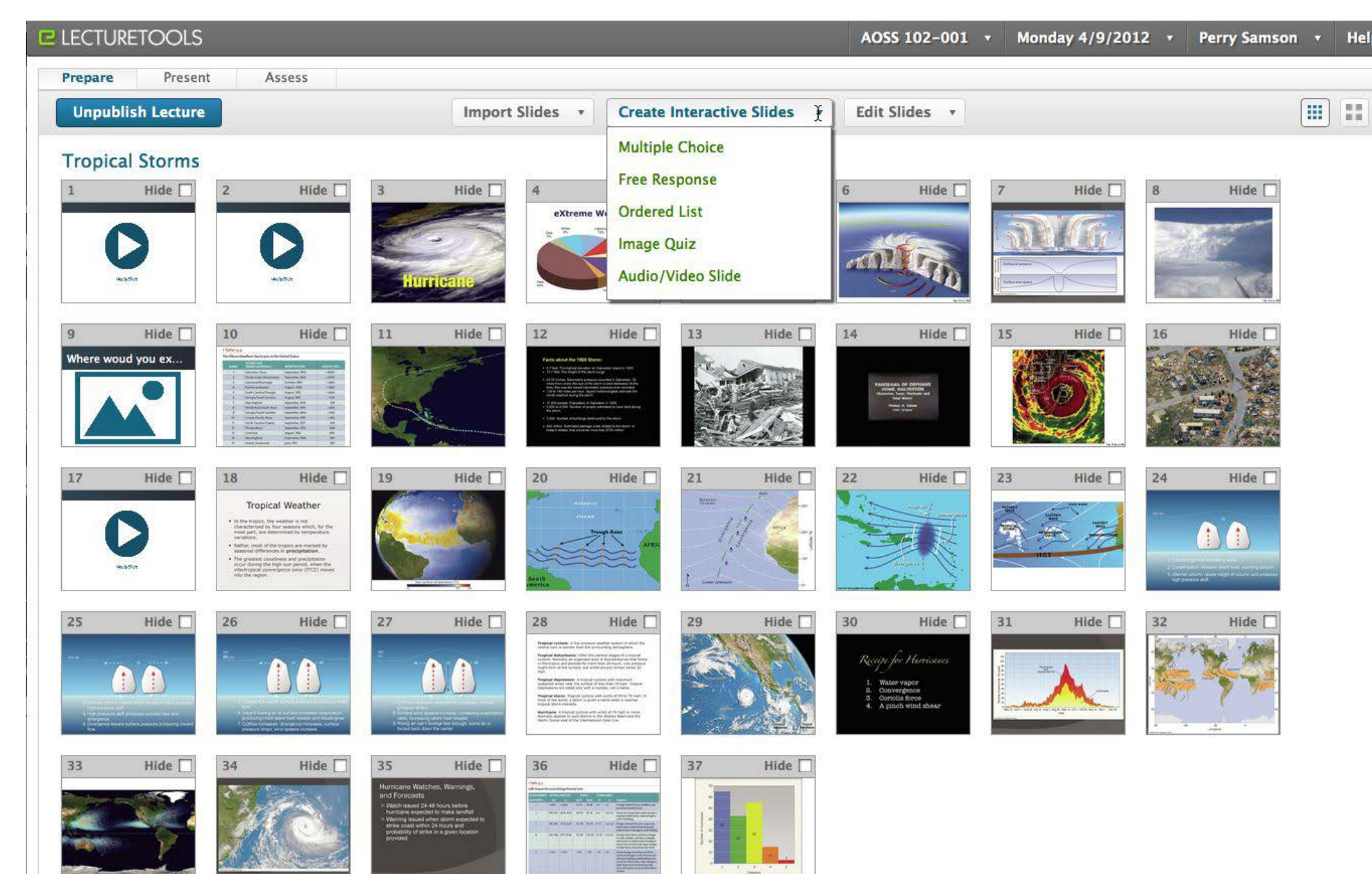
For the Instructor

Goals

- A) Increase options for students to actively participate in class.
- B) Mine student input to provide more informed guidance

Technology

- 1) Prepare Lecture in LectureTools
 - Upload slides as PowerPoint® or PDF file.
 - Add interactive questions and videos.
 - Hide selected slides if desired.



2) Present Lecture

- Show slides/videos
- Reveal questions/hidden slides as desired
- Display results from student answers
- View student questions

3) Viola!

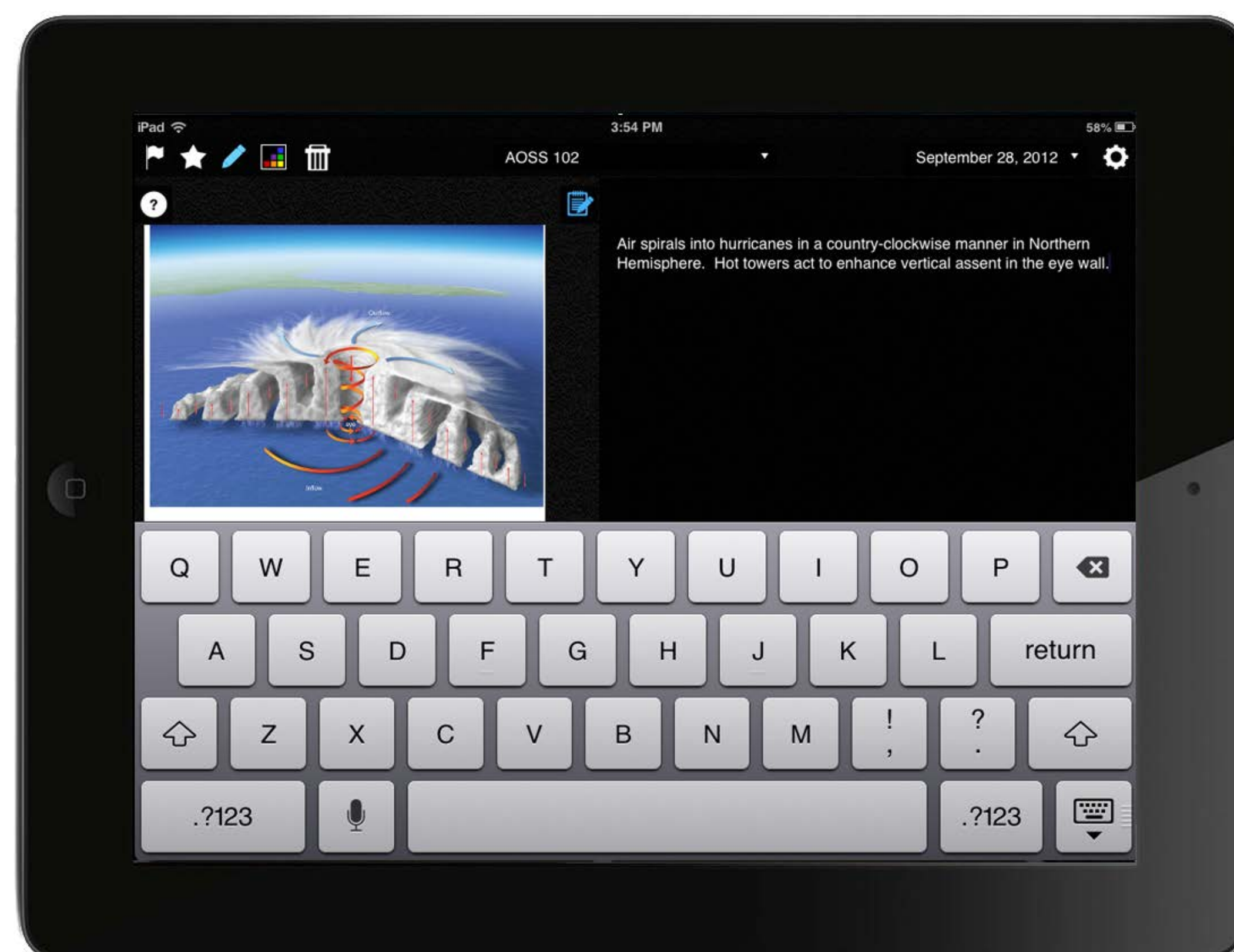
- Students' notes and questions are parsed and mined for keywords and phrases.
- Feedback provided to instructor on what students heard and noted.
- Students' receive "Lecture Cloud" of words with linkages to questions and resources.

4) Review Participation

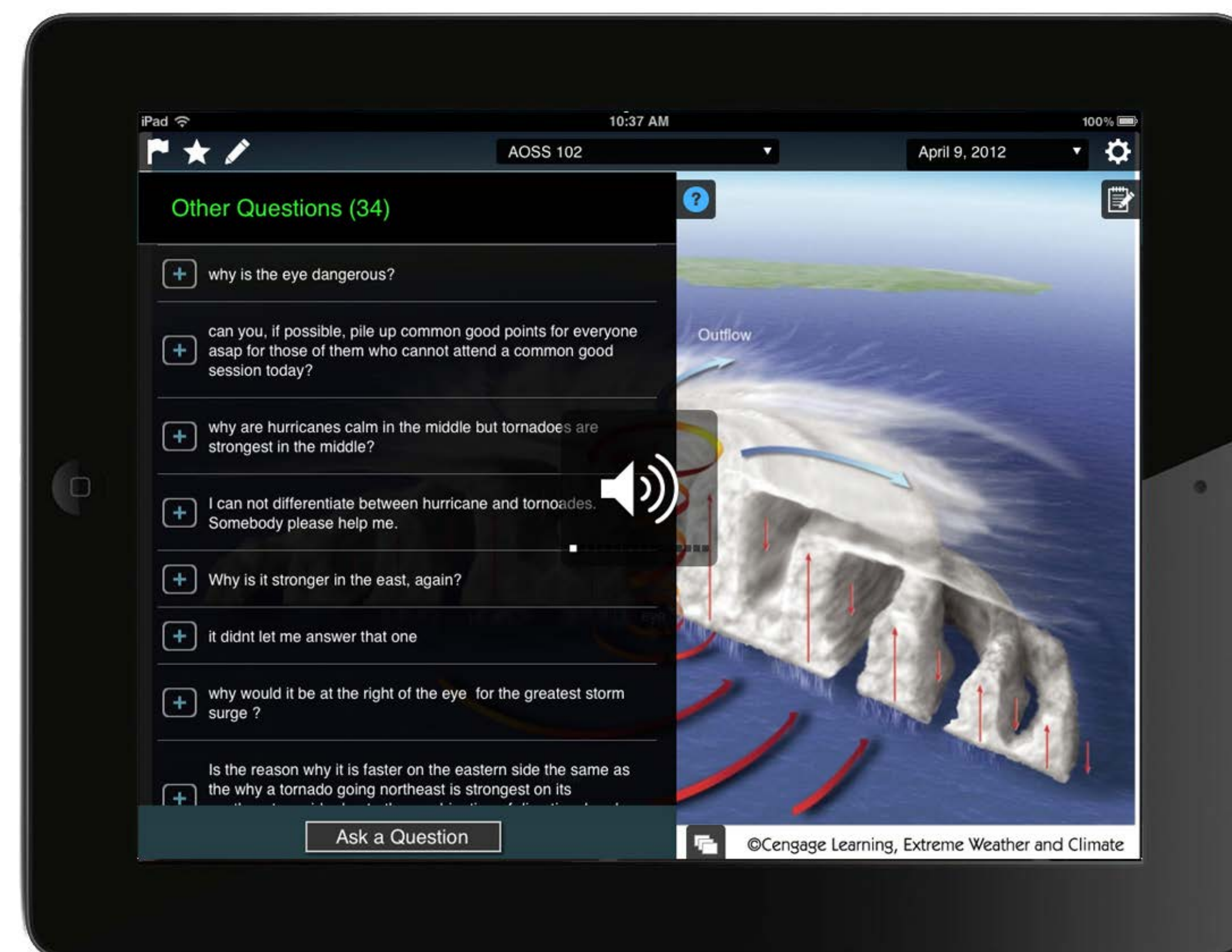
- View attendance
- Review student questions
- Identify slides students found confusing

For the Student

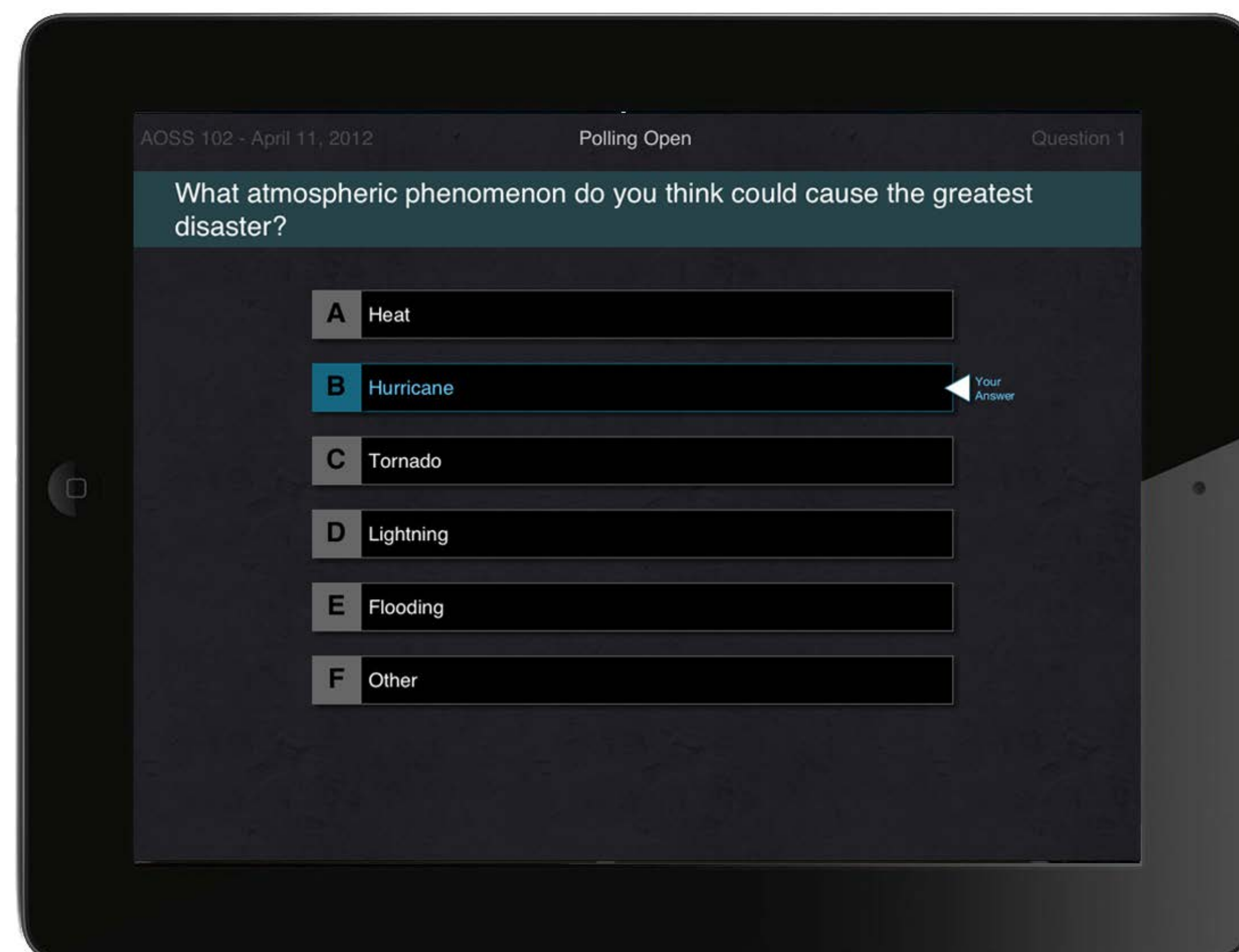
1. Take notes linked to slides



2. Ask questions/See answers



3. Answer instructor questions



Mining Products

Word clouds by lecture

SESSIONS	FIRST SLIDE	WORDS TYPED	AGGREGATED CLASS NOTES PER SESSION	CONFUSED	BOOK-MARKED	ANNO-TATED
Wed, Apr 17, 2013 Weather in Cinema		2659	tornado wind direction wrong away lightning hail water center cloud like moving pressure rotating tornados clear inside storm horizontal	0	0	0
Mon, Apr 15, 2013 Tornadoes II		4337	tornado wind rotation divergence pressure instability rain tornados cloud convective strong shear moving storm downdraft trigger right center radar winds	0	2	34
Fri, Apr 12, 2013 Tornadoes		4903	tornadoes tornado wind ground shear different rotation kansas rate atmosphere cloud lapse occur coriolis near trigger florida moist convective rise	2	1	44
Wed, Apr 10, 2013 Derecho and Downbursts		2635	ground rain winds storm microburst damage downburst moving precipitation wind cloud strong gust line center direction heavy thunderstorm derecho	0	0	25
Mon, Apr 8, 2013 Lightning		3576	lightning cloud ground charge stroke thunder frame metal positive sound electric hear negative return dust strikes potential channel sand hailstone	0	6	5
Fri, Apr 5, 2013 Weather Forecasting		2416	range forecasting weather look models wind looking days clouds long short cloud snow atmosphere forecast humidity cold cover temp	2	6	5
Wed, Apr 3, 2013 Thunderstorms		4799	rain cloud thunderstorm storm updraft ground wind gust cold tornado winds shelf downburst warm line rate severe just anvil green	0	7	50
Mon, Apr 1, 2013 Heat of the Day		8351	ground thunderstorms radiation temperature energy heat temp heating rain sunlight time noon cloud losing shortwave uneven florida gaining rate temperatures langway	2	17	79
Fri, Mar 29, 2013 Anticyclonensis and Heat Waves		4301	heat pressure high sinking night temperature time lower cloud humidity temp water relative ground wave wind cover energy cities urban	1	3	19
Wed, Mar 27, 2013 Linking the Jet Stream to Cyclonensis		9234	divergence pressure WAVE advection storm atmosphere cold warm winds ground upper short areas stream convergence happens tropical wind east strong temperature	0	17	114
Mon, Mar 25, 2013 The Role of the Jet Stream		5064	pressure stream divergence wind gradient temperature greatest ground slope causes east temp trough line troughs speed highest change changes surface	3	26	180
Fri, Mar 22, 2013 Cyclonensis		10211	pressure cold warm storm winds divergence stronger surface wind contrast snow temperature cyclonensis stream wave precipitation north causes center gradient strong	2	2	114
Wed, Mar 20, 2013 Cyclonensis		4984	pressure wind temperature temp changes change stationary cold			

Friday, March 22nd, 2013	Total Words Typed This Class	Aggregated Whole Class Notes	Number Confused	Number Bookmarked	Number Annotated
Cyclonensis	10211	pressure cold warm storm winds divergence stronger surface wind contrast snow temperature cyclonensis stream wave precipitation north causes center gradient strong	2	2	114
Word Cloud of Notes by Slide	Number Confused	Total Bookmarked	Total Annotated		
Slide # 1	5	2893	0	0	0
Slide # 2	16	462	0	1	13
Slide # 3	10	192	0	0	1
Slide # 4	10	168	0	0	4
Slide # 5	14	702	0	0	6
Slide # 6	3	24	0	0	0
Slide # 7	9	58	0	0	0
Slide # 8	5	39	1	0	0
Slide # 9	20	721	0	0	0
Slide # 10	13	180	0	0	0
Slide # 11	10	245	0	0	0
Slide # 12	14	298	0	0	0

Assessment

Test your understanding of "divergence"

Question 1155 [Chapter 10.3]

Q. Net convergence of air would cause surface pressure to _____ and net divergence would cause surface pressure to _____.

increase, decrease

increase, increase

decrease, decrease

decrease, increase

Submit your answer

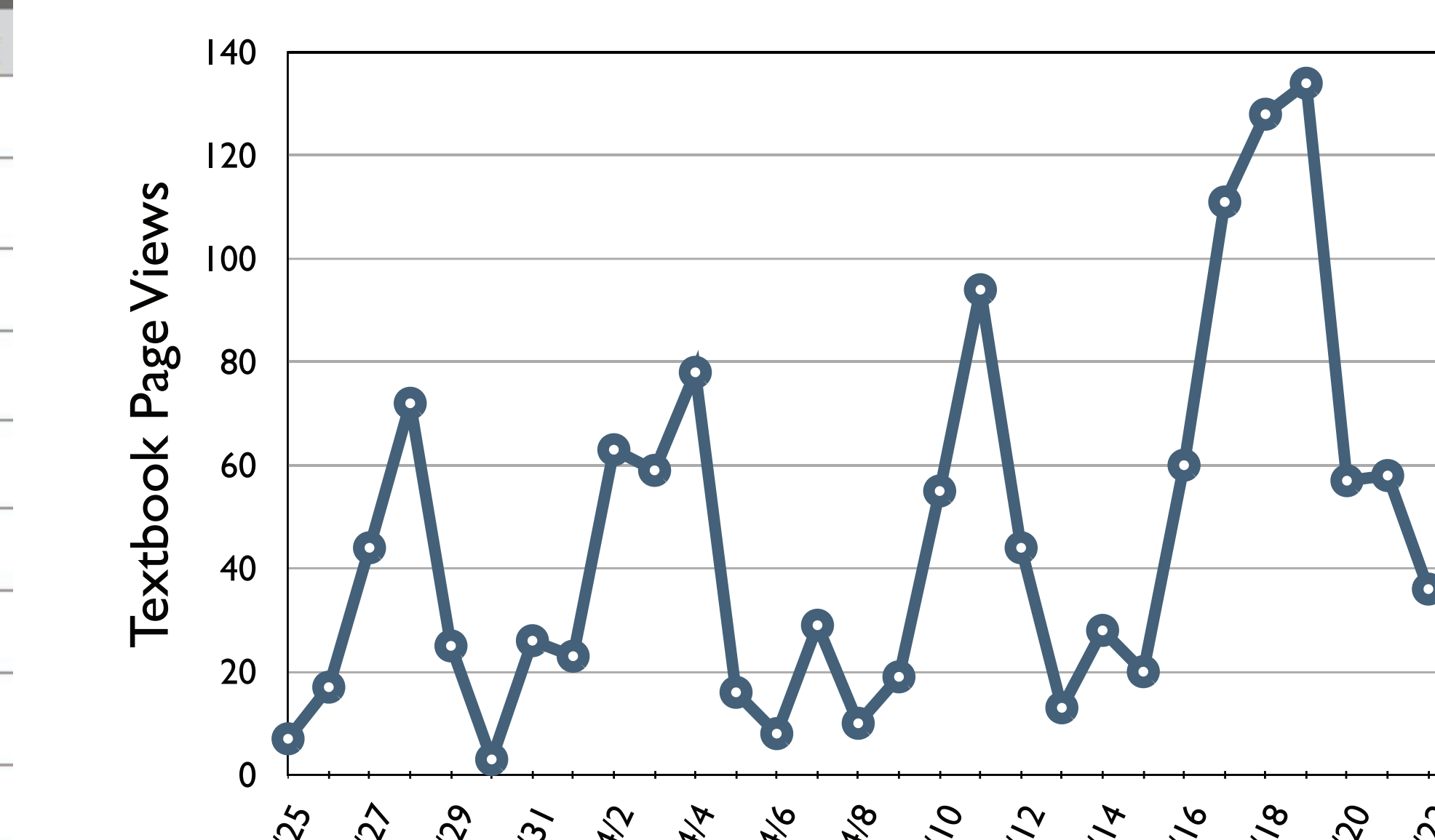
Your choice is incorrect.

The term "divergence" is discussed on page 276 of *Extreme Weather and Climate*.

Check out the following resources to learn more about "divergence":

- LectureBook
- Vimeo
- UMich Library
- Wikipedia
- Merlot
- Google
- Khan Academy
- YouTube
- Bing

Usage statistics



Word clouds by slide

Located the term "divergence" on Page 276 of *Extreme Weather & Climate*, Ahrens & Sanson, © 2010 Cengage Learning

Resources

276 Chapter 10

FOCUS ON A SPECIAL TOPIC

A Closer Look at Convergence and Divergence

We know that convergence is the piling up of air above a region, while divergence is the spreading out of air above some region. Convergence and divergence of air may result from changes in wind direction and wind speed. For example, convergence occurs when moving air is funneled into an area, much in the way cars converge when they enter a crowded freeway. Divergence occurs when moving air spreads apart, much as cars spread out when a congested two-lane freeway becomes three lanes. On an upper-level chart, this type of convergence (also called confluence) occurs when contour lines move closer together, as a steady wind flows parallel to them (see the upper-level chart in Fig. 3). On the same chart, this type of divergence (also called diffluence) occurs when the contour lines move apart as a steady wind flows parallel to them. Notice that below the area of divergence lies the surface middle-latitude cyclonic storm.

Convergence and divergence may also result from changes in wind speed. Speed convergence occurs when the wind slows down as it moves along, whereas speed divergence occurs when the wind speeds up. We can grasp these relationships more clearly if we imagine air molecules to be marching in a band. When the marchers in front slow down, the rest of the band members squeeze together, causing convergence; when the marchers in front start to run, the band members spread apart, or diverge.

Figure 3 The formation of convergence (CON) and divergence (DIV) of air with a constant wind speed (indicated by flags) in the upper troposphere. Circles represent air parcels that are moving parallel to the contour lines on a constant pressure chart. Below the area of convergence the air is sinking, and we find the surface high (H). Below the area of divergence the air is rising, and we find the surface low (L).