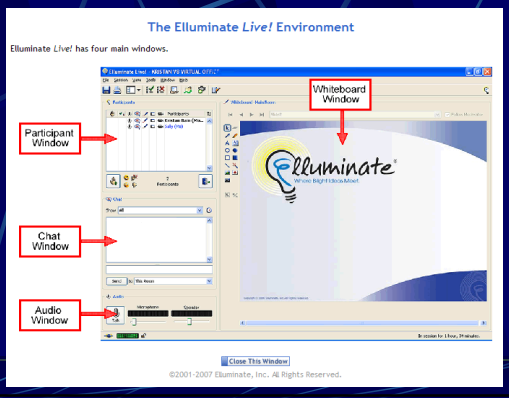
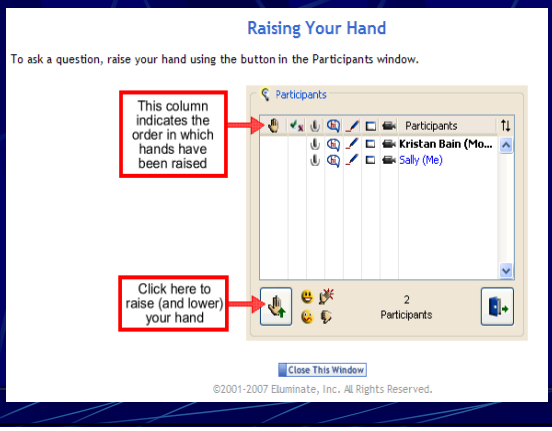
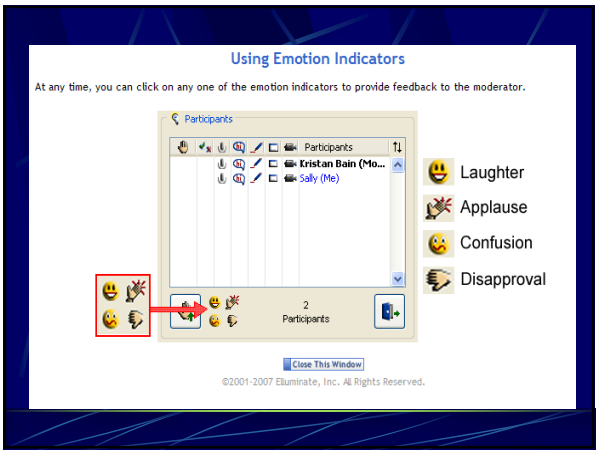
Welcome to IRSC's Live Virtual Lesson on Scientific Notation

Instructor: Mrs. DiMartino

How to participate in this session.






Using Emotion Indicators
At any time, you can click on any one of the emotion indicators to provide feedback to the moderator.
Participants
Participants
Kristan Bain (Mo...
Sally (Me)
2
Participants
Laughter
Applause
Confusion
Disapproval
Close This Window
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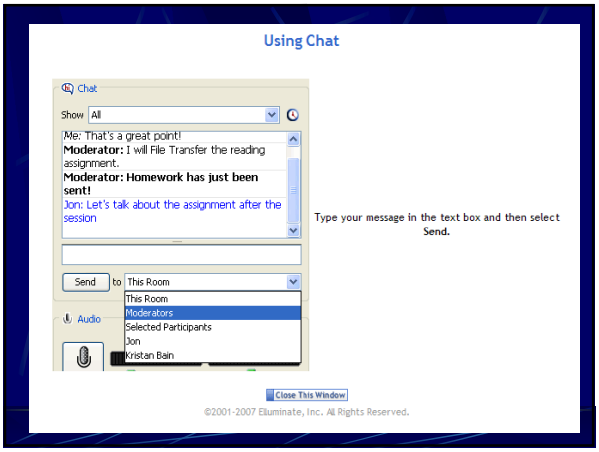
Using Chat
Chat
Show All
Me: That's a great point!
Moderator: I will File Transfer the reading assignment.
Moderator: Homework has just been sent!
Jon: Let's talk about the assignment after the session
Send
to This Room
This Room
Moderators
Selected Participants
Jon
Kristan Bain
Audio
Type your message in the text box and then select Send.
Close This Window
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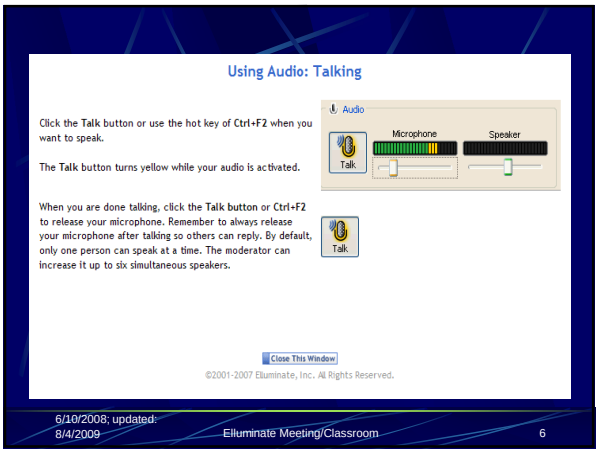
Using Audio: Talking
Click the Talk button or use the hot key of Ctrl+F2 when you want to speak.
The Talk button turns yellow while your audio is activated.
When you are done talking, click the Talk button or Ctrl+F2 to release your microphone. Remember to always release your microphone after talking so others can reply. By default, only one person can speak at a time. The moderator can increase it up to six simultaneous speakers.
Audio
Microphone
Speaker
Talk
Talk
Close This Window
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Using Audio: Talking

Use the Microphone and the Speaker sliders to adjust the volume for your microphone and speakers. The gauges below the sliders show the audio levels when you or someone else is speaking. Use the following guidelines to set your Mic slider when you are speaking:

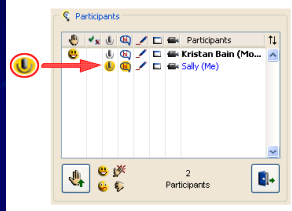
Setting Too Low

Setting Optimal

Setting Too High

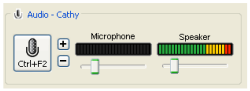
Close This Window

Using Audio: When Someone Else is Talking



The microphone icon in the Participants window glows...

The speaker's name appears on the title bar of the Audio window.



Close This Window

Viewing Presentations

The moderator controls how you view the presentation, so all you need to do is watch, listen, participate, and learn.

When the **Follow Moderator** option is checked, you will see only the screen that the moderator has selected.

When the **Follow Moderator** option is de-selected, use the forward and backward arrows of the whiteboard to navigate through the screens.

Close This Window

Let's get started!
All you need to do is:

Watch
Listen
Participate
Learn

What you will learn:

1. How to convert a number from standard form to scientific notation.
2. How to convert a number from scientific notation to standard form.
3. How to convert numbers that are *less than one*. Ex: 0.00056
4. How to convert numbers that are *greater than one*. Ex: 56,000,000,000

Scientific Notation

What is it?

A short-hand way of writing very large and very small numbers without writing all of the zeros.

Why use it?

It was developed in order to easily represent numbers that are either very large or very small.

It is easier to read and tell at a glance what the order of magnitude is (rather than counting zeros).

An example of why to use it.

The Distance From the Sun to the Earth

93,000,000

Converting Standard Form to Scientific Notation Step 1:

- Locate the decimal.
- Move the decimal to the left.
- Leave only one number in front of the decimal.

93,000,000 = 9.3000000

Step 2:

- Write the number without zeros.

93,000,000 = 9.3

Step 3:

- Count how many places you moved the decimal. (7 spaces)
- Make that your power of ten (your exponent).

$93,000,000 = 9.3 \times 10^{7}$

The power of ten is 7 because the decimal moved 7 places.

$93,000,000 = 9.3 \times 10^{7}$

- 93,000,000 --- Standard Form
- 9.3×10^7 --- Scientific Notation

Practice Problems

Write the following in scientific notation. Decide the power of ten (exponent).

1. 98,500,000 = $9.85 \times 10^?$ 9.85×10^7
2. 64,100,000,000 = $6.41 \times 10^?$ 6.41×10^{10}
3. 279,000,000 = $2.79 \times 10^?$ 2.79×10^8
4. 4,200,000 = $4.2 \times 10^?$ 4.2×10^6

More Practice

On these, decide where the decimal will be moved.

1. 734,000,000 = _____ x 10^8
2. 870,000,000,000 = _____ x 10^{11}
3. 90,000,000,000 = _____ x 10^{10}

Answers

1) 7.34×10^8 2) 8.7×10^{11} 3) 9×10^{10}

Practice Problems

Write in scientific notation.

1) 50,000
2) 7,200,000
3) 802,000,000,000

Answers

1) 5×10^4 **2) 7.2×10^6**

3) 8.02×10^{11}

Converting Scientific Notation to Standard Form

In this case, move the decimal to the right to return it to a whole number. The exponent tells you how many spaces to move.

3.4×10^5 in scientific notation
3.40000 move the decimal 5 spaces
340,000 is standard form

Write in Standard Form

Remember to move the decimal to the right.

- 6.27×10^6 → 6,270,000
- 9.01×10^4 → 90,100

Working With Decimals
(Numbers less than one.)

Example

.0000087

Step 1:

- Move the decimal to the right.
- Leave only one number in front of decimal.

.0000087 = 000008.7

Step 2:

- Write the new number **without** zeros.

000008.7 = 8.7

Step 3:

- Count how many places you moved the decimal.
- Make that your power of ten (exponent)
- Note that it must be a negative number since you moved to the **right** this time.

$000008.7 = 8.7 \times 10^{-6}$

$0000087 = 8.7 \times 10^{-6}$

The power of ten is -6 because the decimal moved 6 places to the right.

- **.0000087 --- Standard Form**
- **8.7×10^{-6} --- Scientific Notation**

Reminder:

You should end up with a negative exponent when converting a number that is less than one to scientific notation.

- Ex: .0000067 = 6.7×10^{-6}

You should end up with a positive exponent when converting a number larger than one to scientific notation.

- Ex: 64,000 = 6.4×10^{4}

Practice Problems

Write the following in scientific notation. Decide the power of ten.

1) .00058 = $5.8 \times 10^{?}$ — 5.8×10^{-4}
2) .056 = $5.6 \times 10^{?}$ — 5.6×10^{-2}
3) .000897 = $8.97 \times 10^{?}$ — 8.97×10^{-4}
4) .00000069 = $6.9 \times 10^{?}$ — 6.9×10^{-7}

More Practice

On these, decide where the decimal will be moved.

1) .000859 = _____ $\times 10^{-4}$
2) .0000000547 = _____ $\times 10^{-8}$
3) .00000887 = _____ $\times 10^{-6}$

Answers

1) 8.59×10^{-4} 2) 5.47×10^{-8} 3) 8.87×10^{-6}

Practice Makes Perfect

Write in scientific notation.

1) .00005
2) .0000072
3) .0000000000802

Answers

1) 5×10^{-5} 2) 7.2×10^{-6} 3) 8.02×10^{-11}

Scientific Notation to Standard Form
(With Numbers Less than One)

Move the decimal to the left.

- 3.4×10^{-5} in scientific notation
- 000034 move the decimal & add zeros
- .000034 in standard form

Write in Standard Form

Move the decimal to the left.

- 6.27×10^{-6} ⟶ .00000627
- 9.01×10^{-4} ⟶ .000901

It's your turn to try!

Write the following in scientific notation. Decide the power of ten (exponent).

64,000,000

For the following practice problems, type your answers in the chat box at the left.

Answer: 6.4×10^7

How?

Move the decimal to the left until you have only 1 number in front of the decimal. Then drop the zeros.

64,000,000. becomes 6.4

How many spaces did you move the decimal? 7

Now you have: 6.4×10^7

Here's another one to try:

Write the following in standard form:

8.7×10^5

Answer:

870,000

How?

The exponent 5 tells you to move the decimal to the right 5 spaces to create a whole number.

More Practice

Write the following in scientific notation.

.000065

Answer:

6.5×10^{-5}

How?

- **Move decimal to the right until only 1 number is in front of the decimal. Drop the zeros.**

.000065 becomes 6.5

- **You moved 5 spaces to the right, so the exponent 5 should be negative.**

6.5×10^{-5}

Practice

Convert this one to standard form.

2.1×10^0

Answer:

2.1

The zero does not affect the answer.

Any questions?

Print your participant window.

Why? To email to your instructor as proof of attendance. To get 1 hour of credit towards your 10 hours this week.

How? Place your cursor and left click your mouse on the participant window. On your keyboard, hold down the SHIFT and PRINT SCREEN keys. Then open a Word document and paste (Ctrl + V). Last, attach it to an email or word document and email it to your instructor.

Final Comments

- This session has been recorded for you to play back and view at any time.
- If you have any questions regarding this topic at a later time, don't hesitate to contact your instructor.
- Don't forget to use the Smarthinking tutor feature within your class site. A tutor is available to you 24 hours a day.

Thank you for joining us!

I hope you will take advantage of our future workshop offerings and will attend some of those as well.

Have a great day!