Egg Animation: Math Extension Lesson Plan

(Note: This Math extension is intended to be used after the Egg Animation ICT Lesson.)

Theme: Communication, Connections, Problem-solving, Reasoning

Learner: Grades 4, 5, and 6

Time: 60 - 80 minutes (20 minutes for each exercise.)

Task 1: Introduction to Math Extension (~20 min)
Task 2: Introduction to Fractions (~20 min)
Task 3: Introduction to Decimals (~20 min)

Description:

Student practice fractions, decimals, and graphing by answering questions about the time duration for playing frames of a clip. Answers can then be graphed.

Teaching Point Synopsis:

1. Fractions
2. Decimals
3. Graphing
4. Use of these concepts in real life.

Objectives: (Grades 4, 5, and 6)

Math Standards (Grade 4):

- Relate physical materials, pictures, diagrams to mathematical ideas (Communication)
- Reflect on and clarify thinking about mathematical ideas and situations (Communication)
- Recognize relationships between different topics in mathematics (Connections)
- Use mathematics in other curriculum areas (Connections)
- Acquire confidence in using mathematics meaningfully (Problem-solving)
- Draw logical conclusions about mathematics (Reasoning)
- Justify their answers and solution processes (Reasoning)

Math Standards (Grades 5 and 6)

- Reflect on and clarify thinking about mathematical ideas and situations (Communication)
- Use the skill of reading, listening and viewing to interpret and evaluate mathematical ideas (Communication)
- Apply mathematical thinking and modeling to solve problems that arise in other disciplines such as art, music, psychology, science and business. (Connections)
- Acquire confidence in using mathematics meaningfully (Problem-solving)

Prerequisites

It is recommended that teacher and students have completed and understood the following before starting this math extension:

1. Completed the Egg Animation Main Lesson or some equivalent because the questions are based on the concepts learned in the main lesson.

2. Students will need to understand the basic concepts of fractions, decimals and graphics.

Materials and Setup:

- A computer for the questions and animation clip demonstrations
- If desired, student can work on this on individual computers with "In VIVO" loaded and running
- If desired, this can be a class exercise on overhead or an individual worksheet exercise.

Materials provided on the CD-ROM under the Egg Animation Materials Folder:

- Egg Animation Math Extension – Fractions (Questions and Animation clip which require computer to run. Also available as a worksheet.)
- Egg Animation Math Extension – Decimals (Questions and Animation clip which require computer to run. Also available as a worksheet.)
- Egg Animation Math Extension – Graphing (Questions and Animation clip which require computer to run. Also available as a worksheet.)

Other Uses:

Students can create similar questions in fractions, decimals, or graphing for the class using their own animations.

Task 1: Introduction (Summary)

Introduce the Egg Animation Extension Lesson

Task 2: Fractions (Summary)

Answer the questions and discuss all the multiple choice answers.

Task 3: Decimals (Summary)

Answer the questions and discuss all the multiple choice answers.

Task 4: Graphing (Summary)

Graph the information and answer the questions.

Task 1: Introduction (Detailed Explanation)

- Tell the class that there are 3 exercises based on animations – one on fractions, one on decimals and one on graphing.
- Click on “Task #2” button or show the page "Egg Animation Fractions" (with questions).
- If you are using the CD-ROM, tell the class that when the 3 questions are answered correctly they can click on the link to view the animation.

Task 2: Fractions (Detailed Explanation)

Question 1: If an animation clip has 10 frames and all frames are played in 1 second, how long does it take to play each frame?
Answer: It takes 1/10 of a second to play each frame

Question 2: If an animation clip has 10 frames, how long would each frame play if you played the clip once in 2 seconds?
Answer: It takes 1/5 or 2/10 of a second to play each frame

Question 3: If an animation clip has 10 frames, how long would each frame play if you played the clip twice in 1 second?
Answer: It takes 1/20 of a second to play each frame

Strategy Help students work through the logic, if necessary.

- For each question, ask how many frames would be played in one second
- As again how long each frame would play. For each answer given, put the value under each frame and then add the values together. If the total does not equal the number of frames played in 1 second, help students to move closer to the right answer
- Discuss all the multiple choice answers
- “Play” to view the animation clip.

Task 3: Decimals (Detailed Explanation)

Question 1: If an animation clip has 10 frames and all frames are played in 1 second, how long does it take to play each frame?
Answer: It takes .1 of a second to play each frame

Question 2: If an animation clip has 10 frames, how long would each frame play if you played the clip once in 2 seconds?
Answer: It takes .2 of a second to play each frame or .20 of a second (.2 and .20 are the same)

Question 3: If an animation clip has 10 frames, how long would each frame play if you played the clip twice in 1 second?
Answer: It takes 1/20 of a second to play each frame

Strategy Help students work through the logic, if necessary.

- For each question, ask how many frames would be played in one second

- As again how long each frame would play. For each answer given, put the value under each frame and then add the values together. If the total does not equal the number of frames played in 1 second, help students to move closer to the right answer
- Discuss all the multiple choice answers
- "Play" to view the animation clip.

Task 4: Graphing (Detailed Explanation)

Exercise 1:

- Graph information from tables. (Hint: Look at the labels on the x and y axes.) Then answer the multiple choice question below.

Questions:

Which of the following is / are true:

a) The number of frames per second increases as the length of time for each frame increases.

b) The number of frames per second decreases as the length of time for each frame increases.

c) The number of frames per second increases as the length of time for each frame decreases.

d) The number of frames per second decreases as the length of time for each frame decreases.

Exercise 2:

- Graph the information in the tables above. (Hint: Look at the labels on the x and y axes.) Then answer the multiple choice question below.

Which of the following is / are true:

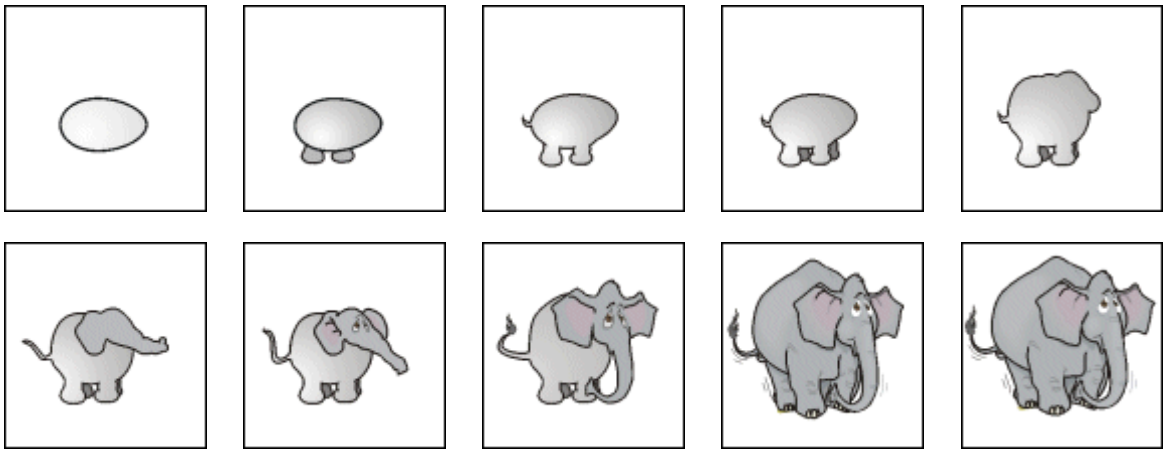
a) The clip plays faster as the length of time for each frame increases.

b) The clip plays faster as the length of time for each frame decreases.

c) The clip plays slower as the length of time for each frame decreases.

d) The clip plays slower as the length of time for each frame increases.

Egg Animation: Math Extension – Decimals



Question 1:

If an animation clip has 10 frames and all frames above play in 1 second, how long does it take to play each frame?

a) .10 second
b) 1.0 seconds
c) .1 minute

Question 2:

If an animation clip has 10 frames, how long would each frame play if you played the clip once in 2 seconds?

a) .05 second
b) .2 second
c) .20 second

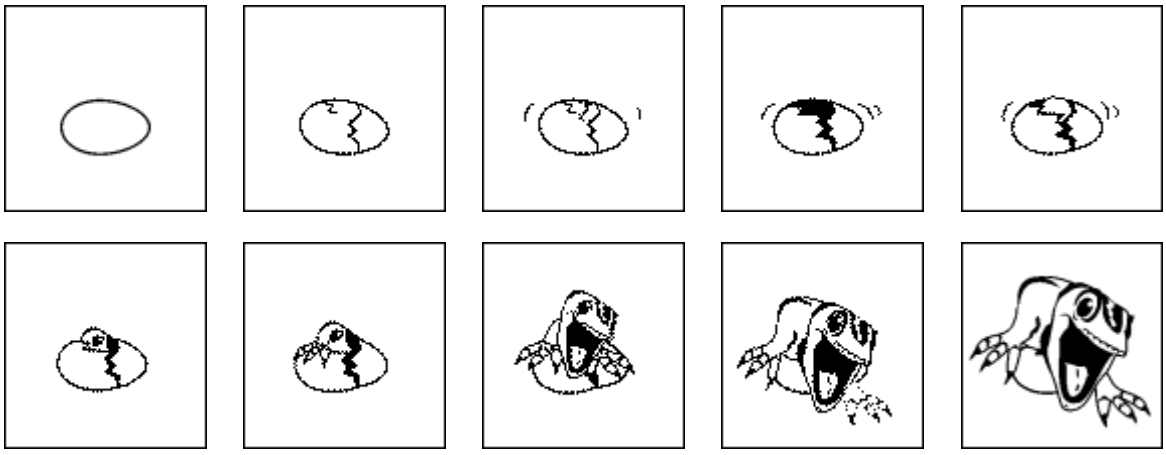
Question 3:

If an animation clip has 10 frames, how long would each frame play if you played the clip twice in 1 second?

a) .02 second
b) .05 seconds
c) .4 second

Decimals : Answers ~ **Question 1:** a) .10 second ; **Question 2:** b) .2 second or .20 second ; **Question 3:** b) .05 second

Egg Animation: Math Extension – Fractions



Question 1:

If an animation clip has 10 frames and all frames above play in 1 second, how long does it take to play each frame?

a) 1/10 second
b) 10/10 seconds
c) 1/10 minute

Question 2:

If an animation clip has 10 frames, how long would each frame play if you played the clip once in 2 seconds?

a) 1/20 second
b) 2/10 second
c) 1/5 second

Question 3:

If an animation clip has 10 frames, how long would each frame play if you played the clip twice in 1 second?

a) 2/20 second
b) 1/20 seconds
c) 2/5 second

Fractions : Answers ~ **Question 1:** a) 1/10 second ; **Question 2:** b) 1/5 or 2/10 second ; **Question 3:** b) 1/20 second

Egg Animation: Math Extension – Graphing

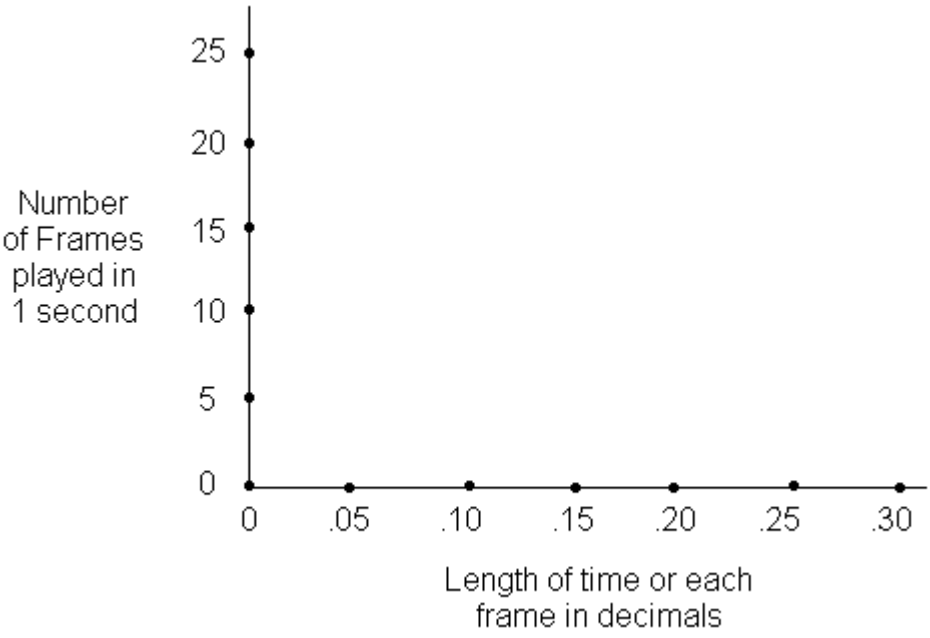
Table 1

No. of Frames played in 1 second	Length of Time for each frame (decimals)
10 Frames	.1
20 Frames	.05
5 Frames	.2

Table 2:

Length of Time to Play the Clip	Length of Time for each frame (fractions)
1 second	1/10
2 seconds	1/20
1/2 second	1/5

Exercise 1:
Graph the information in the tables above. (Hint: Look at the labels on the x and y axes.) Then answer the multiple choice question below.



Which of the following is / are true:

a) The number of frames per second increases as the length of time for each frame increases.

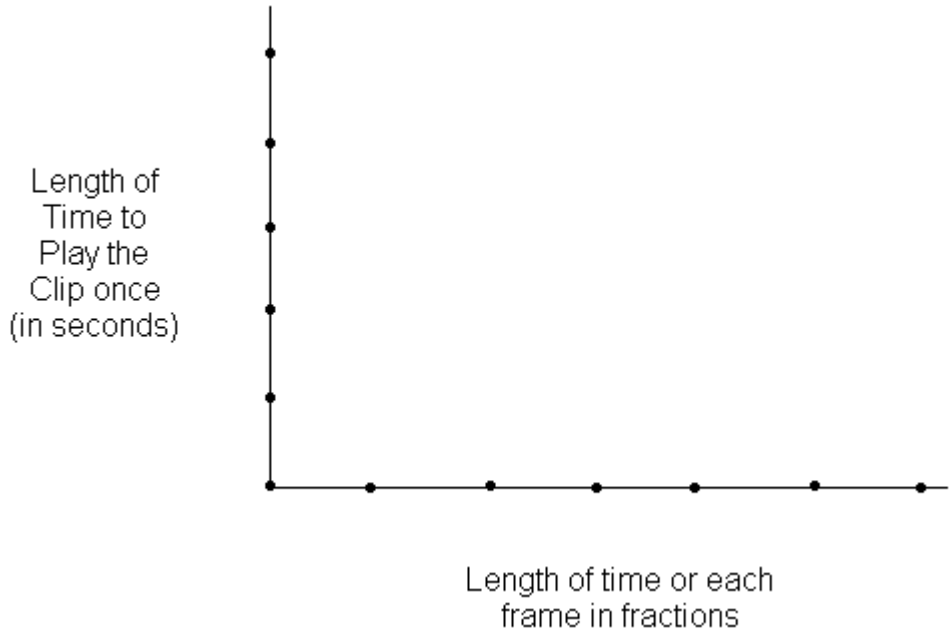
b) The number of frames per second decreases as the length of time for each frame increases.

c) The number of frames per second increases as the length of time for each frame decreases.

d) The number of frames per second decreases as the length of time for each frame decreases.

Exercise 2:

Graph the information in the tables above. (Hint: Look at the labels on the x and y axes.) Then answer the multiple choice question below.



Which of the following is / are true:

a) The clip plays faster as the length of time for each frame increases.

b) The clip plays faster as the length of time for each frame decreases.

c) The clip plays slower as the length of time for each frame decreases.

d) The clip plays slower as the length of time for each frame increases.

Egg Animation: Math Extension – Graphing

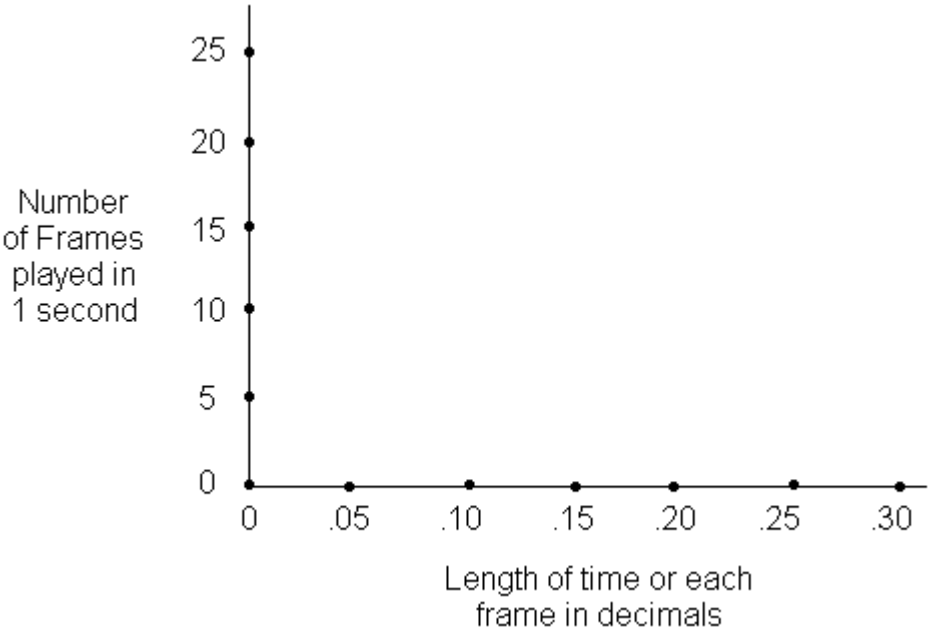
Table 1

No. of Frames played in 1 second	Length of Time for each frame (decimals)
10 Frames	.1
20 Frames	.05
5 Frames	.2

Table 2:

Length of Time to Play the Clip	Length of Time for each frame (fractions)
1 second	1/10
2 seconds	1/20
1/2 second	1/5

Exercise 1:
Graph the information in the tables above. (Hint: Look at the labels on the x and y axes.) Then answer the multiple choice question below.



Which of the following is / are true:

a) The number of frames per second increases as the length of time for each frame increases.

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c) The number of frames per second increases as the length of time for each frame decreases.

d) The number of frames per second decreases as the length of time for each frame decreases.

Tips & Tricks

- Teach students decimals and fractions before starting this lesson
- Teach students how to graph information before starting this lesson
- Ensure students understand how to label the X and Y axis
- For a variation, change the number of frames and time for each question

Marking Guide

Do Students:

- Conceptually understand fractions
- Conceptually understand decimals
- Label the x and y axis proportionately
- Plot information on the graph correctly

Answer Key:

Decimals

Question 1: a) .10 second

Question 2: b) .2 second

Question 3: b) .05 second

Fractions

Question 1: a) 1/10 second

Question 2: b) 2/10 second or c) 1/5 Minute

Question 3: b) 1/20 second

References

http://www.tech4learning.com/pdfs/claykit/animating_fractions.pdf (retrieved September 10, 2004)

http://www.istopmotion.com/education/animation (retrieved September 10, 2004)

http://www.mathwright.com/book_pgs/book180.html (retrieved September 10, 2004)

http://mathforum.org/library/drmath/sets/elem_fractions.html (retrieved September 10, 2004)

http://www.mpsomaha.org/willow/p5/handhelds/activities/decimals.html (retrieved September 10, 2004)