

# Project-Based Learning

## Rate Trailer

**8th Grade**

**Math**



# Rate Trailer

## 8th Grade

### Math

#### Overview

A movie production company is requesting proposals for a young filmmakers series involving linear functions.

Students will explore proportional and non-proportional relationships within a real world context.

Students will demonstrate their understanding by communicating accountable content through an original film trailer.

#### Guiding Questions

What is the difference between proportional and non-proportional situations?

What are examples of proportional and non-proportional situations?

What are different ways to represent linear, proportional situations?

When graphing proportional relationships, how do you interpret the slope?

How do you solve direct variation problems?

What are different ways to represent linear, non-proportional situations?

How do you distinguish between the proportional and non-proportional situations?

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## PBL Project Guide

### Timeframe

This project will take approximately fourteen 50-minute class periods.

### Step-by-Step Overview

- Introduce Launch Video.
- Introduce Entry Document.
- Facilitate Know/Need to Know activity.
- Students engage in an exploration activity.
- Groups brainstorm initial design products and assign roles/responsibilities.
- Groups alternate between facilitated content experiences and design time.
- During design time, groups integrate new content into design and re-evaluate product(s).
- Groups finalize product(s) and presentation.
- Groups present according to project guidelines.
- Content Debrief.
- Summative Assessment.

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## PBL Resources

### Project Resources

- Launch Video:  
<https://youtu.be/nOfH7uEojKk>
- Entry Document Text
- Anticipated Knows/Need to Knows
- Strategies/considerations for implementation

### Resources to Assemble/Prepare

You will need to prepare the following resource(s) ahead of time:

- Format Entry Document to reflect a movie production company and educational company
- Select individuals as product-specific experts and for presentation panel
- Verify access to technology links
- Sample authentic products similar to project expectations
- Select Launch Video
- Informational resources about linear functions

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## Entry Event Guide

### Launch Video

Mary Poppins (1964): Trailer HQ : <https://youtu.be/nOfH7uEojKk>

Purpose: Engages students and introduces the topic of subtle storytelling. Use video to solicit student responses to the following questions: *What elements of the movie trailer make the viewer want to watch the film? Where in the trailer were examples of rate of change?* Post student responses.

### Entry Document

**Format:** *Call for Movie Proposals* from a Movie Production Company. Edit document to include a movie production company and educational company of choice. Include logistics, such as submission dates and presentation requirements.

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## Entry Event Guide *continued*

### Entry Document

[MOVIE PRODUCTION COMPANY LOGO]

#### Call for Movie Proposals: Young Filmmakers Division

[MOVIE PRODUCTION COMPANY] is launching into a new area. While we have produced films for younger consumers for decades, we have not produced films by young filmmakers. Additionally, we have always encouraged informal education, but we have not made it deliberate. We have now partnered with [EDUCATIONAL COMPANY] and they would like the next few films to take a mathematical focus, specifically a *linear function* focus. We believe that a film can entertain the consumer while subtly providing instruction. Children's television programs have built this concept into a gargantuan industry and it is now time to do so in film.

We would like to see young filmmakers tell a story that is important to them and do so in such a way that the audience is engaged both mentally and emotionally. The subject of the film is up to the filmmaker but it must fit one of the following categories: Narrative, Documentary, or Animation.

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## Entry Event Guide *continued*

### Entry Document *continued*

In order to be considered for production, a 2-3 minute trailer for the movie and the storyboard for the full film must be submitted. Additionally, the following requirements must be met in the trailer:

- Follow a general storyline and include a cliffhanger
- Provide informal definitions and examples of proportional and non-proportional relationships
- Express proportional relationships with multiple representations
- Demonstrate the interpretation of slope in proportional relationships
- Show characters solving situations of direct variation
- Express non-proportional relationships with multiple representations

Please prepare a 5-minute persuasive presentation that utilizes technology and markets your trailer, highlighting both the linear function content and storyline. The proposal and presentation to staff members of [MOVIE PRODUCTION COMPANY] are due [DUE DATE]. Additional consideration will be given to those who submit extensive development of the narrative and animation or extensive research for the documentary.



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## What do we KNOW about the project?

### Content

- Film will take a linear function focus
- Trailer needs to include informal definitions and examples of proportional and non-proportional relationships
- Trailer needs to include multiple representations of proportional relationships
- Trailer needs to include interpretations of slope in proportional relationships
- Trailer needs to include characters solving problems involving direct variation
- Trailer needs to include multiple representations of non-proportional relationships

### Product

- [MOVIE PRODUCTION COMPANY] is requesting proposals for a film from student filmmakers
- Film can be narrative, documentary, or animation
- Proposal includes a storyboard and a trailer for the full film
- Trailer needs to follow a storyline and include a cliffhanger
- Submissions are to be accompanied with a 5-minute technology-based persuasive presentation about the trailer and how it touches on content and narrative
- Submissions and presentations are due on [DUE DATE]

Additional responses will vary

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## What do we NEED to know about the project?

### Content

- What is a linear function?
- What are proportional and non-proportional relationships?
- What are examples of proportional and non-proportional relationships?
- How do you represent proportional relationships in multiple ways?
- What does it mean to interpret slope and how do you do interpret slope?
- How do you solve direct variation problems?
- How do you represent non-proportional relationships in multiple ways?

### Product

- What is a narrative, documentary, and animation film?
- What is a storyboard and film trailer?
- What is a storyline and cliffhanger?
- What applications can you use to create the trailer?
- What type of presentation can you prepare?

Additional responses will vary

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## Additional Information

This PBL alternates content and design time so that students are consistently revising their products. This document is a framework for teachers to use. Teachers may manipulate it to fit the needs of their students and classroom. This is an example of how a teacher might organize this PBL to meet those needs.

Content Workshop #1 - Definition of proportional and non-proportional and examples thereof

Design Time #1 (Individual) - Decide on type of film and begin outline of film including examples

Content Workshop #2 - Multiple representations of linear, proportional situations

Design Time #2 (Individual) - Address current examples of proportional situations by including multiple representations and incorporate into the trailer

Content Workshop #3 - Interpreting slope in proportional relationships

Design Time #3 (Individual) - Address graphed examples with interpretations of slope and include within the trailer

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## **Additional Information *continued***

Content Workshop #4 - Solving direct variation problems

Design Time #4 (Individual) - Generate a storyline in which characters solve direct variation (proportional) examples and build into the trailer

Content Workshop #5 - Multiple representations of linear, non-proportional situations

Design Time #5 (Group) - Address current examples of non-proportional situations by including multiple representations and incorporate into the trailer

Content Workshop #6 - Distinguishing characteristics of proportional and non-proportional situations

Design Time #6 (Group) - Generate a storyline in which characters solve direct variation (proportional) examples and build into the trailer; finish deliverables

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## Implementation Guide

### Websites

Ensuring Mathematical Success for All  
<http://www.nctm.org/PtA/>

Comparing and Contrasting Proportional and Non-Proportional Linear Relationships  
<http://www.projectsharetexas.org/resource/comparing-and-contrasting-proportional-and-non-proportional-linear-relationships>

Define and Interpret Linear Relationships in Tables  
<https://learnzillion.com/lessons/3511-define-and-interpret-linear-relationships-in-tables>

StoryboardThat  
<http://www.storyboardthat.com/>

### Teaching Strategies/Considerations

Consider the guiding questions for the project when selecting content workshops. A combination of practice and hands-on activities should be included.

Have students develop an understanding of constant rate of change before beginning their proposal.

Consider having students use math notebooks or journals to meet the project expectations of recording their video outline and revisions. Have them record notes from content workshops.

### Visual Resources

Consider having examples of trailers ready for students to view as a resource.

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## Assessment/Presentation

### Final Group Product

- Movie proposal submission that meets requirements
- Maximum 5-minute presentation that includes the trailer and highlights content and narrative

### Rubric

- Students will use the entry document as a real world rubric to meet expectations of the project.

### Individual

- Individual assignments as they pertain to each content workshop
- Journal entries documenting what the individual has contributed to the movie proposal
- Record of trailer design process and revisions made over the course of design, assessed throughout the project
- Summative assessment

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