

Alignment Drawing: Website Content in Support of Learning & Teaching Math

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Teaching & Learning Goals & Tasks

Based on usability tests and interviews with 12 students and 7 instructors.

Legend

Area of Focus

Goal

Task: Popular (5+ people)

Task

Value

Website Content & Features

Essential support for goal/task

Secondary support for goal/task

External links

Homework

Learn a concept

Review topic covered in class

Explanation of reasons for steps

Find examples

Find practice problems with feedback

Find rules

Find what's related to a topic

Find what's not related to a topic

Hear my tutor explain it to me

Preview topic

Get a sense of what topic is/ does

Understand use in real life

Get unstuck

Find alternative explanations of a concept

Understand language

Discover steps to solve my problem

Find answer to my problem

Find site with language I understand

Evaluate a site for usefulness

Find out order I'm supposed to do stuff in

Studying for Tests

Prepare for a Test

Print study guide

Prepare for standardized test

Practice: get feedback on what's wrong

Recognize complex question phrasing

Avoid incorrect solution path

Discover which topics will be covered on test

General Learning

Relate concepts to real life

Understand use in real life

Translate math language

Translate math language

Look up definitions

Brush-up on basics

View clear-cut examples

Find supporting concepts

Build confidence

Build comfort level with a concept

Recognize common errors

Discover if I can place out of algebra

Build mathematical thinking capability

Teaching

Find curriculum resources

Preview topic: What do I need to cover?

Find lesson plan ideas

Find resources that use approach I prefer

Find resources that match my curriculum

Find resources that match my teaching style

Find pedagogy resources

Strive to support diverse learners

Find common sticking points for students

Look for strategies

Look for patterns

| | | | | | | | | | |
|--|--|--|---------------------------------|---|---|---|--|------------------------------|--|
| Algebraic calculator | Topic outline | Sidebar with related basics & study aids | Rules | Real-life examples | Vocabulary definitions display in-page | Collapsible explanations of basic concepts generally covered earlier in math sequence | Self-quiz with results | Example classroom activities | Information on supporting all learners |
| Type in problem: get answer | Examples with steps written out | Mathcasts | Practice problems with feedback | Explanations written in both mathematic language and everyday language | Explanations written in both mathematic language and everyday language | Practice exercises with unlimited new problems | Practice exercises with unlimited new problems | Links to teacher resources | Teaching-approach metadata |
| Problem-solving aids (e.g. divisibility rules) | Mathcasts | Examples with steps written out | Printable 3x5 study aids | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | Personalized challenges | Personalized challenges | Search | |
| Examples with steps written out | Practice problems with feedback | User inputs problems & sees solution | All pages are printable | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | Progress tracking | Progress tracking | | |
| Math translation | Basic and in-depth explanations of a topic | Vocabulary definitions | | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | | | | |
| Vocabulary definitions | Real-life examples | Clear headings throughout the page | | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | | | | |
| Write problem using everyday language | Links to related topics | Clear navigation | | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | | | | |
| Link to related mathcasts | Printable lists of rules | User posts questions & hears back from others | | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | | | | |
| Describe common mistakes | | Pattern visualizations that reinforce concepts | | Collapsible explanations of basic concepts generally covered earlier in math sequence | Collapsible explanations of basic concepts generally covered earlier in math sequence | | | | |

This framework represents:

- 1) Goals and tasks related to teaching and learning math, as expressed by participants in usability evaluations and training discussions
- 2) Website content and features that might support those goals and tasks.

The goals and tasks, located in the top half of the framework, are organized into focus areas (homework, studying for tests, general learning, and teaching). Tasks that were mentioned by 5 or more people have a shaded background (green). Website content and features are displayed in the bottom half of the framework, aligned with the goals and tasks they can support.