Designing Educational Experiences
What is Roblox Education?

Designing with Learning in Mind

Developing an Experience
What is Roblox Education?
Our Mission
To support 100 million students learning on Roblox and Roblox Studio by 2030.

Roblox Education invests in amplifying and bringing high-quality educational experiences to our platform to help educators and students explore phenomena, practice skills, and learn together.
Our Partners

Project Lead the Way

Working to reach 250,000 students with computer science, engineering, and biomedical science content on Roblox.
Our Partners

**FIRST & Filament Games**

**FIRST Robotics**, an international organization with over one million participants, and **Filament Games** are bringing complex, rich, robotics-building experiences to Roblox.
Educational experiences designed and developed by the Roblox community.

Left to right:
Knossos Palace by FracturedOreo
Fushimi Castle by Hiuh29
Untamed Planet by Untamed Planet
Lua Learning by BoatBomber

Print Statements
There are quite a few ways to format a print statement in Lua. This is because of Lua’s syntax for creating strings, and for calling print.

"string"
'value'
[[string]]

While double-quotes (") and single-quotes (’) are both acceptable ways to define a string, a string needs to be opened and closed by the same type of quote mark. You can’t do "string'. Calling print can use parentheses, so that allows you to print even more items.

\nprint("Hello", "World!")
print("Hello".." World!")
print("Hello World!")

Instructions:
1. Use multiple print statements. Try out multiple syntaxes!

+ Hint
Roblox developers have the potential to transform learning.

Access
Roblox aims to support 100 million students learning on our platform by 2030 through high-quality educational content.

Platform
Roblox as a platform is uniquely suited for engaging, multiplayer educational content.

Support
Roblox Education is dedicated to supporting developers as they produce content.

Have Impact
Use game development as a way to unlock immersive learning experiences for educators and students.
Opportunities in Education

Educational Experiences
Designing an experience or game to teach a specific subject, such as physics or history.

Training and Serious Games
Using Roblox as a learning space, such as hosting lectures, 1:1 tutoring, or social spaces.

Plugins and Tools
Developing and selling tools to developers working in education.
Designing with Learning in Mind
Educational Experience

A playful, interactive, digital experience with one or more expressed learning objectives.
Anyone Can Build

You can build educational experiences on Roblox and help students everywhere learn, explore, and practice skills ranging from critical thinking, collaborative problem solving, and creativity. Roblox Education wants to help you get started.
What Can You Develop?

- Time travel to roleplay a historical event
- Experiment with physics on a different planet
- Practice inventing new materials in a chemistry lab
- Teach engineering skills by building bridges
- Create connections with a different cultural group
- Explore strategies for improving mindfulness
A strong educational experience has ...

**Learning Objectives**
Learning is built-in first, not as an afterthought.

**Solid Core Loop**
The core loop is related to the learning you want to provide.

**Balanced Learning and Play**
Players are rewarded for learning, not just playing.
Balancing Learning and Fun

Mars Horizon, designed in collaboration with the European Space Agency, is a simulation game where you run and manage a space agency.
Roblox Example

Balancing Learning and Fun

RoboCo Sports League, by Filament Games, teaches the engineering design process by allowing players to build robots for collaboration and competition.
HoloLAB Champions, by Schell Games, is what happens when you mix chemistry class with a stressful game show.
Developing an Experience
Development Process

Identify Audience
Who is the experience for? A school classroom? At-home students? The workplace?

Determine Standards
What will you teach? How is that taught? How do you know they're learning? What topics lend themselves well to game-based learning?

Design a Core Loop
How can gameplay be integrated in the core loop? Is it fun? Are you learning?

Develop

Test and Prototype
How can you adapt your process to meet the needs of your audience and learning standards? Who can help you test and get feedback?
Our example experience ...
Fruit Fly Fighter

Pet auto-battler where you breed different types of flies, selecting for traits that improve their survivability in PvE-based challenges. Built for at-home learning.
1. Identify the Audience

Classrooms

At-Home Learning

Workplace Training
1. Identify the Audience

Classrooms
- Gameplay sessions are often 30 minutes for a class.
- Dedicated audience, with lower focus on retention.
- Strong need for alignment to educational standards.
- Unique opportunities to plan for class integration (EX: micropayments for lesson plans or subscriptions).

At-Home Learning
- Traditional Roblox gameplay session times and needs, such as player retention.
- Looser requirements for educational standards.
- Competing with other entertainment options, but parents value education.

Workplace Training
- Often in niche topics.
- Work may be for an organization.
- Requirements will be unique based on the needs of a contracting organization.
Different user age ...

Different design needs

Under 10
Stronger need for FTUE. Gameplay focus on experimentation and free-form play. Low motor skill abilities.

Middle to High School
Enjoys goal-oriented gameplay and forms of healthy competition. Can handle more complex topics and greater motor complexity.

College and Young Adult
Can interact with and enjoy complex topics and systems.

Adult and Professional
Can't assume game literacy is common. May need stronger FTUE and guidance.

Read More: Design for Kids
1. Age Differences (In-Depth)

**Ages 10 - 12**

**Cognitive:** Develop the ability to think abstractly in "what if" thinking. Morality can be more complex and goes past laws and rules.

**Social Development:** Often become preoccupied with appearance, have strong likes and dislikes, and interested in roles. Concerned that others will exclude them.

**Age 13 - 15**

**Cognitive:** Stronger ability to grasp abstract and hypothetical concepts.

**Social Development:** Increasingly aware of their own feelings, and may be self-conscious of themselves, appearance, and relationship with their self and society.

**Ages 15 - 18**

**Cognitive:** Can have deep philosophical arguments and fuse information from multiple disciplines.

**Social Development:** Strong desire for independence and beginning to think about future and careers.

*Read More: Common Sense Media*

Common Sense has a rating system for different ages. For each age group, you can see key differences, and recommendations per age for development.
Fruit Fly Fighter: Audience

At-Home Users
Middle to High School Aged

Highly social; wants to experience content with friends

Enjoys exploration and experimentation

Competing with other entertainment, but valued by parents.
1. Identify a Learning Standard

What is a Learning Standard?

A concise description of what a student is expected to know or be able to do.

Often created by formal education institutions and provided directly to educators. It's trusted and approved.
1. Identify a Learning Standard

**MS-PS2-1 Motion and Stability: Forces and Interactions**

Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.

**California 7.11: Students analyze political and economic change in the Age of Exploration**

Discuss the exchanges of plants, animals, technology, culture, and ideas among Europe, Africa, Asia, and the Americas and major economic and social effects on each continent.
1. Identify a Learning Standard

**MS-LS3-2 Heredity: Inheritance and Variation of Traits**

Develop and use a model to describe why ... and *sexual reproduction results in offspring with genetic variation.*
Fruit Fly Fighter: Learning Standard

MS-LS3-2 Heredity: Inheritance and Variation of Traits

Develop and use a model to describe why … and sexual reproduction results in offspring with genetic variation.

Sample Standards to Teach:
● Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.
● In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring.
Subject Matter Experts
They understand your topic in-depth. You may have someone on your team, or you may be able to contract an educator to assist.

Investigate Resources
Learning standards often map to curricular and instructional materials that demonstrate how existing instruction teaches to those standards.

Connect with Roblox Education
We can provide resources for finding a subject matter expert or guidance on quality materials to reference.
Fruit Fly Fighter: Curriculum Examples

Unit Overview
8.5 Genetics

Why are living things different from one another?

Unit Summary
This unit on genetics starts out with students noticing and wondering about photos of two cattle, one of whom has significantly more muscle than the other. The students then observe photos of other animals with similar differences in musculature: dogs, fish, rabbits, and mice. After developing initial models for the possible causes of these differences in musculature, students explore a collection of photos showing a range of visible differences.

In the first lesson set, students use videos, photos, data sets, and readings to investigate what causes an animal to get extra-big muscles. Students figure out how muscles typically develop as

OpenSci Ed
Teaching Genetics in Classrooms

Punnett Square Game

Punnett Squares - Pea Plants WS

1) Yellow seeds are dominant over green seeds in pea plants. Fill in the Punnett square and determine the expected genotypes and phenotypes along with the probabilities from crossing homozygous recessive and homozygous dominant parents.

Possible genotypes of offspring: __________________

Possible phenotypes of offspring: __________________

Percentage of offspring that are yellow: _____ % green: _____ %
% of offspring that are homozygous dominant: _____ %

heterozygous: _____ % homozygous recessive: _____ %

If there were 100 seeds collected, predict how many would be yellow? _____, green? _____
Predict how many seeds would be homozygous dominant? _____, heterozygous? _____, homozygous recessive: _____

NGSS Life Sciences
Simulate Genetics Over Time
There's only so much a student can interact with a worksheet. An experience on Roblox offers more opportunity for simulation.

Show Scale with Multiplayer
Scale can be shown through examples, but students can directly participate and contribute to a genetics simulation through gameplay.

Create Engagement, Not Rote Puzzles
By adding a layer of game-based interactivity, learning the information can become more engaging.
3. Designing the Core Loop

Concepts Pulled From Curriculum Samples

- Punnett Squares
- Chromosome Pairs
- Genetic Variation

Gameplay Mechanics

- Identify and Sort
- Collect and Gather

User Situations

- Raising Pets
- Work with Fruit Flies
Fruit Fly Fighter: Bad Core Loop
Learning and gameplay is disconnected

- Each pet has a fun fact next to their in-game profile.
- The types of pets are based on the names of real-life animals.
- Quest givers are named after famous people.
- Quest text tells you facts about genetics.
- Finishing a quest gives you an exciting fact about genetics.
Fruit Fly Fighter: Better Core Loop

Learning and gameplay is connected

- Pets are found during quests. Users determine which pets to keep to raise for future generations.
- Pets have inheritable traits that are transferred to offspring.
- Traits are dominant or recessive and have an element of choice and surprise.

- Quests have players finding pets with specific traits they'll need to factor into their raising process.

- Raise Pets
- Go On Quests
- Sort Quest Rewards
Core Loop

Raise Pets

- Identify and sort for desirable traits.
- Select breedings that are desirable for an objective.
Core Loop

Go On

Quests

● See how pets perform for objectives.

● Gather pets with desirable traits.
Core Loop

Sort Quest

Rewards

- Identify desirable traits
- Upgrade facilities
Fruit Fly Fighter Recap

Target Audience
- At-home students of middle to high school age.
- Students have expectations of common Roblox elements (such as quests), while parents and educators want standards.

Learning Standards
- Using Next Generation Science Learning Standards.
- Standards focus on teaching the topics of genetics and transmission of traits through reproduction.

Gameplay Loop
- Users raise pets by identifying desirable traits, combining them in new offspring, and observing how those pets meet challenges to make changes for a future generation.
- Gameplay and learning are intermixed and balanced, not separate.
Developing
For Education
Developing for education has some constraints.

Quick to Pick Up
Teachers and students are limited on time.

Limited Tech
Many schools use Chromebooks or laptops with limited hardware specs.

Stakeholders Want Standards
To be used in classrooms, you often have to align learning to specific learning standards. For at-home learning, parents may also want to see standards.

Monetization Is Different
Monetizing has some restrictions, but also opportunities unique to educational audiences.
Fruit Fly Fighter Development Notes

Quick to Pick Up
- Users will get a strong first-time user experience, teaching them how to play within minutes with a guided, active tutorial.
- Gameplay sessions can average 5-10 minutes.

Limited Tech
- Stylized low-poly graphics lower technical requirements.
- Strong emphasis on mobile optimization and play.

Stakeholders Want Standards
- Documentation on our website communicates information to parents and educators about the educational impact.
- In-game information provides additional context for users.
Designing Monetization For Education

Avoid Aggressive Monetization
Keep monetization subtle; avoid forceful pop-ups.

Keep the Core Loop Free
Users should be able to experience the whole loop without payment.

Investigate Alternatives
Lesson plans, direct support to teachers, subscriptions.

Find Partners, Funding, or Grants
Different groups can assist in funding your experience development costs.
# Fruit Fly Fighter Monetization Plan

## In-Game Purchases
- In-game avatar items and cosmetics.
- No ability to purchase game passes that "speed" up the loop.

## Investigate Alternatives
- Paid lesson plans for educators interested in classroom usage.
- 1:1 paid video support and training for teachers to answer questions about the experience.

## Funding
- Apply for grant funding (both via the Roblox Community Fund and other organizations).
- Investigate partnership options with an educational institution for funding and building outreach.
Prototype and Test with Outside Support

Subject matter experts, classroom teachers, and even students can support your success. **They can...**

- Playtest and offer feedback
- Help brainstorm ideas
- Confirm your content meets learning objectives
- Talk about what works in the classroom
- Offer guidance on a subject or specific topic
- Describe technology used in the classroom
Next Steps
1. Identify the Audience
Classroom? At-home student? Workplace training?

2. Determine a Learning Standard
What are you teaching? How is that subject currently covered in curricular and instructional materials?

3. Design a Core Loop
How does the game loop reinforce your core learning objectives? How can you balance learning and fun?

4 & 5. Develop, Prototype, and Test
Make modifications to the development process to ensure your project’s educational success. Find partners and talk to educators and students as you test to ensure the game is fun and learning is meaningful.
We're Here to Support

ROBLOX Education

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- Documentation
- Open Office Hours
- Community Fund Support
- Networking with Educators
- Learn and Explore Sort
Opportunities to Connect

Games for Change Conference
Includes educational games and games for social impact. Great networking opportunity with wide and diverse audiences (commercial devs, schools, and more)

Serious Play Conference
Academic focused conference. Great for workplace and classroom focused audiences.

Play, Make, Learn + GEE! Awards
Mix of academics and developers. Hosts an annual contest for best learning games.

Roblox Developer Forum (Education Support)
Place to communicate with other Roblox developers interested in education.

International Game Developers Association
Has a serious games special interest group. Opportunity to connect with others through Discord and share resources and get feedback.
Education Resources

Learning Standards
Next Generation Science Standards - Respected and common standards for science.
AP College Board - Series of exams with standards for high school to college coursework.

Note: Many states and nations have their own unique standards. Search their Department of Education website.

Free Trusted Curriculum
OpenSci Ed - Free courses for science in K-12 subjects.
EdReports - Database of trusted textbooks and curriculum for math, science, and English language arts.
Khan Academy - Variety of resources for K-12 subjects.
Games for Inspiration

Experiences on Roblox

- Plane Crazy
- StockRise
- 1867 Historical Roleplay
- Bird Simulator
- Lua Learning
- Alo Sanctuary

Other Games

- Code Combat
- while True: learn()
- DragonBox Algebra
- The Counting Kingdom
- Human Resource Machine
- Anything from Filament Games
- Never Alone
- Poly Bridge
- Kerbal Space Program
Thanks from the Education Team!

Let's Stay in Touch!
Get advice on development, learn about Roblox funding, or ask about programs like Learn and Explore Sort.
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