

LEGO Brickfilm Bootcamp: The Foundation of Frame-by-Frame

Materials Needed

- Digital device (Smartphone, tablet, or dedicated camera)
- Stop Motion Animation App (e.g., Stop Motion Studio, iMotion)
- Tripod, flexible mount, or sturdy stack of books (Crucial for camera stability)
- LEGO bricks and at least one minifigure
- Desk lamp or consistent lighting source
- Paper and pencil (for storyboarding)

Lesson Objectives (What You Will Learn)

By the end of this lesson, you will be able to:

1. Explain how Frame Rate (FPS) makes static objects appear to move.
2. Set up a stable and consistent filming environment (Stagecraft).
3. Create smooth motion by using tiny, incremental movements between frames.
4. Plan and execute a simple 20-frame animation sequence.

Introduction: The Magic of Motion

Hook (Tell Them What You'll Teach)

Imagine you have a favorite LEGO minifigure, and you want them to run across the screen and jump over a barrier. They are just plastic, right? So how do the brilliant animators make them move and act like tiny people? It all comes down to a sneaky trick called "Persistence of Vision."

Think about flipping through a sticky note pad really fast. If each note has a slightly different drawing, your brain sees it as motion! Stop motion is the same thing, just with real objects.

Success Criteria

You will know you are successful when your final 20-frame animation (The Minifigure Entrance) shows movement that looks smooth, not jumpy, and your camera stays perfectly still throughout the entire process.

Body: Building the Basics

I Do: Understanding Frames and Stability (Modeling)

Step 1: The Science of Smoothness

Educator Modeling & Explanation:

I will explain two important terms:

- **Frame:** One still picture. A movie is just thousands of still pictures played in sequence.
- **Frame Rate (FPS):** How many frames (pictures) we show per second. Professional movies are 24 FPS. We are aiming for 8-12 FPS today. The higher the FPS, the smoother the movement, but the more pictures you have to take!

Step 2: Setting the Stage (The Golden Rule)

The single most important rule in stop motion is: **NEVER BUMP THE CAMERA!**

I will demonstrate setting up the camera rigidly using a tripod or a stack of books. I will show how to position the LEGO stage and ensure the lighting is constant (no shadows moving around).

Modeling the App: I will open the stop motion app, show the capture button, and point out key features like the "Ghost" or "Onion Skinning" feature (the transparent outline of the previous frame—this is your best friend!).

We Do: The Micro-Movement Challenge (Guided Practice)

Activity 1: The Sliding Brick

We are going to make one simple 2x4 LEGO brick slide across the screen in a straight line. This tests stability and micro-movements.

1. **Setup:** Place one 2x4 brick on your stage. Take Frame 1.
2. **Micro-Move:** Nudge the brick forward only a tiny amount—think the width of a piece of paper.
3. **Capture:** Take Frame 2.
4. **Repeat:** Continue moving the brick the same tiny distance and taking a picture for 10 consecutive frames.
5. **Review:** Play the short sequence back. Does the brick move smoothly, or does it jump? Did the background or camera wiggle? (If it wiggled, delete the frames and try again, focusing on steady hands!)

Formative Assessment Check: Ask learners to show their 10-frame slide and identify one thing that made it smooth and one thing that made it jumpy.

You Do: The Minifigure Entrance (Independent Application)

Activity 2: Storyboarding and Animation

Now we apply what we learned to a short narrative.

Step 1: Planning (5 minutes): On paper, sketch out a simple 3-panel storyboard for your sequence:

- Panel 1: Minifigure is just off-screen.
- Panel 2: Minifigure is centered, waving.
- Panel 3: Minifigure is leaving the scene.

Step 2: Execution (20 minutes): Animate the sequence. Remember the goal is 20 frames minimum for the entire sequence.

- **Walking/Sliding:** Move the minifigure forward in extremely small increments (Micro-movements!). Use 3-4 frames just to make the figure move one stud length.
- **Waving:** To make the arm wave, move the arm a tiny bit up for 3 frames, hold it steady for 4 frames, then move it down for 3 frames.
- **Patience:** Remind yourself that 20 frames means 20 separate actions and pictures. Take your time!

Conclusion: Showcase and Reflection

Closure (Tell Them What You Taught)

Let's review the three biggest concepts we learned today:

1. **Stability:** The camera must be rock-solid.
2. **Micro-Movements:** Tiny, tiny changes between frames lead to smooth motion.
3. **Frame Rate:** More pictures per second (higher FPS) means smoother action.

Summative Assessment & Feedback

The Brickfilm Critique: Have the learner present their "Minifigure Entrance" to a partner or the educator/group.

Use the following critique questions:

- Did the minifigure move across the screen smoothly? (Rating: 1-5, 5 being very smooth)
- Was there any camera wobble in the background?
- What was the most challenging part of taking 20 separate pictures?

Reflection Question: If you had to redo the animation, what is the ONE thing you would change to make it smoother?

Next Steps & Monthly Challenge Prep

This is the foundation! Next lesson, we will learn tricks like flying and jumping. Your long-term goal for the end of the month is to create a 30-second short film (around 240 frames) that tells a complete story, incorporating the techniques we learn each week.

Differentiation and Adaptability

Scaffolding (For Struggling Learners)

- **Focus on fewer frames:** Allow learners to start by animating at 5 FPS instead of 8-12 FPS, simplifying the number of photos needed.
- **Use Grid Overlays:** Utilize the grid overlay feature within the app (if available) to help learners measure and maintain straight paths for their characters.

- **Pre-Set Stage:** Provide a pre-set LEGO background to reduce setup time and focus purely on the motion.

Extension (For Advanced Learners)

- **Advanced Movement:** Challenge the learner to animate the minifigure not just walking, but running (requires larger movements and possibly higher FPS).
- **Sound and Titles:** Require the learner to add a title card (2-3 frames) and a simple sound effect (like a recorded "Hi!") using the editing features of the app.
- **Character Interaction:** Introduce a second minifigure and require them to interact (e.g., handshake, high-five) smoothly within the 20-frame limit.

Universal Adaptability Notes

- **Homeschool Context:** The learner can self-critique using the checklist or present to a parent/co-learner. Focus on deep reflection of stability.
- **Classroom Context:** The "We Do" phase can be run as a pair activity where one student handles the movement and the other handles the camera, encouraging collaboration and shared responsibility for stability.
- **Training Context (General Digital Media):** This lesson serves as a foundation for any frame-based digital editing or animation, emphasizing consistency and attention to detail. The concepts of FPS and Onion Skinning transfer directly to professional software.