LESSON 1: Sequential Programming & Shape Creation

MILD: Light Show Square

- Add LED color changes to each corner of your square
- Use different colors for each turn
- Make your square program more visual!
- **Blocks needed:** front LED, back LED, fade blocks

Peer verification required

MEDIUM: Triangle Master

- Create a triangle using correct angles (120 degrees)
- Must complete full triangle returning to start
- Explain why triangles need different angles than squares
- **Blocks needed:** heading, compass direction

Peer verification required

HOT: Polygon Designer

- Create pentagon (5 sides) OR hexagon (6 sides)
- Calculate correct angles: 360 ÷ number of sides
- Show your mathematical working to a peer
- **Challenge:** Explain your angle calculations

Peer verification required

Cut along this line

LESSON 2: Loops & Artistic Programming

MILD: Star Artist

- Create star pattern: Loop 5 times [Roll → Turn 144°]
- Draw on paper with marker attachment
- Figure out why stars need 144-degree turns
- **Test:** Does your star close properly?

Peer verification required

MEDIUM: Animation Loop

- Add matrix LED animations to your patterns
- Different animation for each loop iteration
- Synchronize lights with movement
- **Blocks needed:** matrix animations, timing

Peer verification required

HOT: Mathematical Designer

- Design custom spirograph with calculated angles
- Use angles other than provided examples
- Explain mathematical relationship between angles and pattern
- **Challenge:** Predict pattern before testing

Peer verification required

✂ Cut along this line

LESSON 3: Advanced Events & Interactive Systems

MILD: Motion Master

- Add gyro max detection for extreme spinning events
- Different response for spinning vs other events
- Test by spinning Sphero rapidly
- **Safety:** Spin gently to avoid damage

Peer verification required

MEDIUM: Interactive Art Installation

- Create artistic responses to all physical events
- Each event triggers unique visual/audio combination
- Use matrix animations and synchronized sounds
- **Goal:** Create immersive experience

Peer verification required

HOT: Smart System Designer

- Include charging state events in your system
- Program behaves differently when charging vs unplugged
- Create real-world application concept
- **Think:** How could this solve actual problems?

Peer verification required

Cut along this line

LESSON 4: Conditional Logic & Sensors

MILD: Sound Detector

- Add different sounds for motion vs stillness states
- Alarm sound for motion, gentle sound for stillness
- Test with different movement levels
- **Check:** Do sounds match movement intensity?

Peer verification required

MEDIUM: Traffic Light System

- Create 3-level detection: Green/Yellow/Red
- Use multiple IF statements with different thresholds
- Green (still), Yellow (moderate), Red (fast movement)
- **Test:** Fine-tune threshold values

Peer verification required

HOT: Motion Game Creator

- Create interactive game using accelerometer
- Include timer elements and challenges
- Players must respond within time limits
- **Design:** Make it challenging but fair

Peer verification required

Cut along this line

LESSON 5: Variables & Data Storage

MILD: Timer Challenge

- Create timer variable that counts automatically
- Use loops to increase timer every second
- Reset timer when specific events occur
- **Display:** Show timer on matrix clearly

Peer verification required

MEDIUM: Multi-Variable Tracker

- Track two variables: attempts vs successes
- Calculate success rate or percentage
- Display both values using scrolling text
- **Math:** Show your calculation method

Peer verification required

HOT: Smart Scoring System

- Variables change by different amounts based on event types
- Example: Collision = +5 points, Touch = +1 point
- Include bonus conditions for streaks or speed
- **Design:** Create balanced scoring system

Peer verification required

Cut along this line

LESSON 6: Integration & Game Development

MILD: Multi-Level Game

- Add different difficulty settings using variables
- Easy mode: longer time limits, higher scores
- Hard mode: shorter time, precise requirements
- **Test:** Both difficulty levels work properly

Peer verification required

MEDIUM: Competition Game

- Create two-player system with separate scoring
- Different challenges for each player
- Clear win conditions and feedback
- **Goal:** Make it fun for both players

Peer verification required

HOT: Adaptive Smart Game

- Game changes based on player performance
- Gets harder if player succeeds too easily
- Provides hints if player struggles
- **Advanced:** Use complex conditional logic

Peer verification required

Printing Instructions

- Print on cardstock or heavy paper for durability
- Cut along dashed lines to separate lesson sets
- Cut individual cards along borders
- Store each lesson's cards in separate containers
- Students collect cards as evidence of completion
- Peer verification required before collecting cards