Educator / Facilitator Guide

Walking Robot Explorer

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Walking Robot Explorer* is a hands-on STEM activity where young people build and explore a simple walking robot.
The activity combines **mechanical construction**, **observation of movement**, and **creative expression**, supporting confidence-building and inclusive participation.

This guide supports educators and facilitators during implementation.

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2. Target Group

- **Group size:** 8–15 participants
- **Working mode:** individual work or pairs
- **Experience level:** no prior STEM knowledge required

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3. Learning Objectives

Facilitators support participants to:

- engage in hands-on STEM exploration,
- understand basic principles of movement and balance,
- build confidence through achievable construction tasks,
- express creativity and personal ideas,
- communicate observations and experiences.

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4. Estimated Duration & Structure

Total duration: 3–4 hours (flexible)

Suggested structure:

- Introduction & demonstration: 10–15 min
- Guided construction: 60–90 min
- Testing & experimentation: 30–45 min
- Creative personalisation: 30–45 min
- Sharing & reflection: 20–30 min

📌 Timing can be adapted depending on group needs and mobility schedule.

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5. Materials Checklist

- Walking Robot kits (1 per participant or pair)
- Batteries / power sources
- Decorative materials (markers, paper, stickers, etc.)
- Visual instruction sheets (student scenario)
- Flat testing surface (tables or floor)

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6. Space & Setup Tips

- Arrange tables with enough space for individual work.
- Prepare a **testing area** where robots can walk safely.
- Keep decoration materials separate to avoid early distraction.
- Ensure power sources are distributed **after** basic assembly.

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7. Facilitation Tips

- Demonstrate once, then support individually.
- Encourage participants to work at their **own pace**.
- Avoid “right / wrong” language — use “try”, “test”, “observe”.
- Celebrate small successes (first movement, improvements).
- Ask open questions rather than giving solutions immediately.

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8. Inclusion & Accessibility Notes

- Offer visual instructions at all times.
- Allow participants to work alone or in pairs.
- Provide calm support for participants who feel frustrated.
- Offer breaks or quiet observation if needed.
- Focus on participation, not performance.

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9. Safety & Safeguarding Notes

- Supervise use of batteries and moving parts.
- Check connections before testing.
- Ensure walking area is clear of obstacles.
- Maintain continuous adult supervision.
- Follow project safeguarding procedures at all times.

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10. Common Issues & Troubleshooting

- **Robot does not move:** check battery connection and alignment.
- **Unstable movement:** adjust position of legs or balance.
- **Participant frustration:** pause, observe together, encourage retry.
- **Time pressure:** skip decoration and return later if needed.

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11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos (no faces without consent)
- Short facilitator observation notes
- Optional short participant comments

📌 Evidence supports interim & final reporting.

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12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and is implemented during:

- project mobilities,
- local workshops,
- dissemination events.

Educator / Facilitator Guide

Toy Airplane Engineer

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Toy Airplane Engineer* activity introduces young people to **basic engineering and design concepts** through the construction and testing of a simple toy airplane.
Participants explore **balance, symmetry and movement**, combining STEM thinking with creative expression.

This guide supports facilitators during implementation.

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2. Target Group

- **Group size:** 8–15 participants
- **Working mode:** individual work or pairs
- **Experience level:** beginner-friendly, no prior engineering knowledge required

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3. Learning Objectives

Facilitators support participants to:

- understand basic concepts of **balance and symmetry**,
- explore how design choices affect movement,
- test and improve a simple construction,
- build confidence through experimentation,
- express creativity through personal design choices.

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4. Estimated Duration & Structure

Total duration: 60–90 minutes (flexible)

Suggested structure:

- Introduction & examples: 10 min

- Guided construction: 30–40 min
- Testing & adjustment: 15–20 min
- Creative decoration: 15–20 min
- Sharing & reflection: 10–15 min

📌 Can be used as a **stand-alone activity** or as a **supporting session** within a mobility day.

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5. Materials Checklist

- Toy airplane construction materials
- Lightweight body and wing elements
- Connectors or fasteners
- Decorative materials (markers, stickers, colours)
- Visual student scenario sheets
- Clear testing area

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6. Space & Setup Tips

- Provide enough table space for wing assembly.
- Prepare a short testing zone for safe flight trials.
- Encourage participants to test one change at a time.
- Keep decoration materials available after testing.

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7. Facilitation Tips

- Encourage observation before making changes.
- Use guiding questions: *“What do you think will happen if…?”*
- Avoid correcting designs — let participants test ideas.
- Emphasise that failure is part of engineering.
- Celebrate creative and unusual designs.

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8. Inclusion & Accessibility Notes

- Simple materials make the activity accessible to all.
- Allow participants to test multiple times without pressure.
- Support participants who feel unsure about “engineering”.

- Focus on process rather than flight distance.

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9. Safety & Safeguarding Notes

- Ensure flight testing is done in a **clear, controlled area**.
- Use only lightweight, soft materials.
- Supervise all test launches.
- Follow project safeguarding procedures.

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10. Common Issues & Troubleshooting

- **Plane does not fly:** check balance and wing symmetry.
- **Unstable movement:** adjust wing position or weight distribution.
- **Participant frustration:** suggest small, simple adjustments.
- **Limited time:** focus on one test and reflection.

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11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos (avoid faces without consent)
- Short facilitator observation notes
- Optional participant feedback

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12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and can be implemented during:

- project mobilities,
- design-focused workshops,
- dissemination and family-friendly events.

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Educator / Facilitator Guide

Mini Bug Robot

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Mini Bug Robot* activity introduces young people to basic robotics through a **small, friendly and sensory-light construction**. It is ideal for inclusion-focused groups and works very well as a **short, confidence-building STEM experience**.

This guide supports facilitators during implementation.

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2. Target Group

- **Group size:** 6–12 participants
- **Working mode:** individual work or pairs
- **Experience level:** beginner-friendly, no prior knowledge required

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3. Learning Objectives

Facilitators support participants to:

- explore basic concepts of movement and balance,
- understand simple cause–effect relationships,
- build confidence through quick, achievable construction,
- engage calmly with a STEM activity,
- observe and describe how their robot moves.

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4. Estimated Duration & Structure

Total duration: 2–3 hours (flexible)

Suggested structure:

- Introduction & demonstration: 10 min

- Guided assembly: 40–60 min
- Testing & movement exploration: 30–40 min
- Creative decoration: 20–30 min
- Sharing & reflection: 15–20 min

📌 This activity can also be delivered in **shorter blocks** if needed.

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5. Materials Checklist

- Mini Bug Robot kits (1 per participant or pair)
- Batteries / power sources
- Decorative materials (paper, colours, stickers)
- Visual student scenario sheets
- Flat testing surface

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6. Space & Setup Tips

- Create a **calm workspace** with limited noise and visual clutter.
- Prepare a small shared testing area for observing movement.
- Keep extra batteries and tools available to avoid interruptions.
- Allow enough personal space for participants who prefer it.

---

7. Facilitation Tips

- Demonstrate movement first to spark curiosity.
- Encourage slow, step-by-step assembly.
- Reassure participants that it’s okay to ask for help.
- Focus on observation (“What do you notice?”) rather than results.
- Praise effort and experimentation, not speed.

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8. Inclusion & Accessibility Notes

- Suitable for sensory-sensitive participants.
- Allow participants to work alone if preferred.
- Offer predictable structure and clear transitions.
- Use simple language and visual cues.

- Avoid time pressure and competition.

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9. Safety & Safeguarding Notes

- Supervise battery use and connections.
- Ensure moving parts are handled safely.
- Keep testing areas clear.
- Maintain continuous adult supervision.
- Follow project safeguarding procedures.

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10. Common Issues & Troubleshooting

- **Robot does not move:** check battery orientation and connections.
- **Movement is uneven:** adjust balance or leg position.
- **Participant loses focus:** allow a short break or observation role.
- **Time is limited:** skip decoration and return later.

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11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos (avoid faces without consent)
- Short facilitator observation notes
- Optional participant comments

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12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and can be implemented during:

- project mobilities,
- inclusion-focused workshops,
- dissemination and demonstration events.

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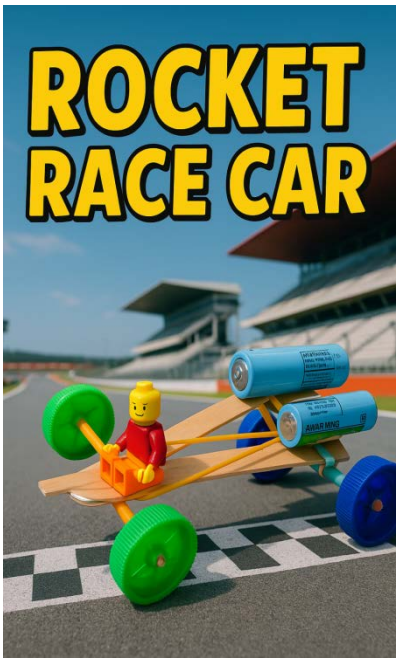
Educator / Facilitator Guide

Rocket Racer Car



Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Rocket Racer Car* is a **team-based STEM challenge** where young people design, build and test a simple racing vehicle powered by safe propulsion mechanisms.
The activity strongly supports **collaboration, communication and shared problem-solving**.

This guide supports facilitators during implementation.

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2. Target Group

- **Group size:** 8–16 participants
- **Working mode:** small teams (2–4 participants per team)
- **Experience level:** beginner-friendly, no prior engineering knowledge required

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3. Learning Objectives

Facilitators support participants to:

- work collaboratively within a small team,
- communicate ideas and make shared decisions,
- understand basic principles of energy, force and motion,
- test and improve a design through experimentation,
- experience positive group dynamics and shared success.

---

4. Estimated Duration & Structure

Total duration: approx. 3 hours (flexible)

Suggested structure:

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- Introduction & challenge briefing: 15 min
- Team formation & planning: 20 min
- Construction phase: 60–75 min
- Testing & improvement: 30–40 min
- Friendly race & sharing: 20–30 min

📌 The competitive element is **non-eliminatory** and focuses on fun, not winning.

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5. Materials Checklist

- Rocket Racer Car kits or construction materials
- Safe propulsion elements (e.g. rubber bands / air-based systems)
- Decorative materials
- Visual student scenario sheets
- Marked testing track or clear floor area

---

6. Space & Setup Tips

- Prepare a **clear racing lane** with safety boundaries.
- Arrange tables for team work and discussion.
- Keep propulsion testing in a **controlled area**.
- Ensure teams have equal access to materials.

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7. Facilitation Tips

- Encourage teams to assign simple roles (builder, tester, designer).
- Support respectful communication and turn-taking.
- Avoid overemphasising speed or competition.
- Ask guiding questions instead of giving solutions.
- Celebrate teamwork and creativity, not performance.

---

8. Inclusion & Accessibility Notes

- Offer flexible team roles to suit different abilities.
- Ensure all participants contribute meaningfully.
- Avoid pressure related to “winning”.

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- Provide additional support to teams experiencing conflict.
- Emphasise cooperation over competition.

---

9. Safety & Safeguarding Notes

- Use **only safe, low-force propulsion mechanisms**.
- Maintain clear safety distances during testing and races.
- Supervise all testing activities closely.
- Ensure participants understand safety rules before racing.
- Follow project safeguarding procedures at all times.

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10. Common Issues & Troubleshooting

- **Car does not move:** check propulsion alignment and friction.
- **Car veers off track:** adjust balance and wheel alignment.
- **Team disagreement:** pause activity and reassign roles.
- **Time pressure:** reduce number of test runs.

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11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos and short videos (no faces without consent)
- Facilitator observation notes
- Short team feedback

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12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and is implemented during:

- project mobilities,
- group-based workshops,
- dissemination and demonstration events.

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Educator / Facilitator Guide

Wire Buzzer Game

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Wire Buzzer Game* is a **focus-based STEM activity** where participants build and use a simple electrical game that rewards precision and patience.
It is ideal for developing **concentration, fine motor control and self-regulation** in a calm, non-competitive environment.

This guide supports facilitators during implementation.

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2. Target Group

- **Group size:** 6–12 participants
- **Working mode:** individual work or pairs
- **Experience level:** beginner-friendly, no prior electronics knowledge required

---

3. Learning Objectives

Facilitators support participants to:

- understand basic **cause–effect relationships** in a simple circuit,
- practice **concentration and controlled movement**,
- follow step-by-step instructions independently,
- regulate pace and attention during a focused task,
- build confidence through precision-based success.

---

4. Estimated Duration & Structure

Total duration: 45–60 minutes (flexible)

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Suggested structure:

- Introduction & demonstration: 5–10 min
- Guided assembly: 20–25 min
- Practice & challenge rounds: 15–20 min
- Sharing & reflection: 10 min

📌 Can be used as a **stand-alone calm activity** or as a **learning station**.

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5. Materials Checklist

- Wire buzzer game components
- Low-voltage power source (safe for youth use)
- Shaped wire paths
- Visual student scenario sheets
- Spare components for quick replacement

---

6. Space & Setup Tips

- Create a **quiet working area** with minimal distractions.
- Provide enough space between participants to reduce pressure.
- Test one buzzer in advance to demonstrate how it works.
- Allow participants to practise without time limits.

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7. Facilitation Tips

- Emphasise calm movement rather than speed.
- Avoid competitive framing (no timers or scores).
- Encourage participants to breathe and move slowly.
- Offer positive reinforcement for effort and improvement.
- Allow repetition without judgement.

---

8. Inclusion & Accessibility Notes

- Suitable for participants who prefer structured, predictable tasks.
- Allow participants to observe before trying.

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- Offer alternative roles (observer, helper) if needed.
- Support participants with attention difficulties through short rounds.

---

9. Safety & Safeguarding Notes

- Ensure all electrical components are **low-voltage and safe**.
- Supervise connections and handling at all times.
- Check wires regularly for damage.
- Maintain continuous adult supervision.
- Follow project safeguarding procedures.

---

10. Common Issues & Troubleshooting

- **Buzzer sounds continuously:** check wire contact points.
- **No sound:** check battery orientation and connections.
- **Participant frustration:** pause, reset, encourage slower movement.
- **Limited time:** focus on one successful completion.

---

11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos (avoid faces without consent)
- Short facilitator observation notes
- Optional participant feedback

---

12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and is implemented during:

- project mobilities,
- inclusion-focused workshops,
- dissemination events highlighting focus & logic skills.

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Educator / Facilitator Guide

Mini Catapult

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Mini Catapult* activity allows participants to **explore basic physics concepts** such as force, angle and distance through a safe, hands-on experiment.
It encourages **curiosity, teamwork and trial-and-error learning** in a controlled environment.

This guide supports facilitators during implementation.

---

2. Target Group

- **Group size:** 8–16 participants
- **Working mode:** individual work or small teams (2–3 participants)
- **Experience level:** beginner-friendly, no prior physics knowledge required

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3. Learning Objectives

Facilitators support participants to:

- explore how **force and angle** affect distance,
- build and test a simple mechanical structure,
- make predictions and observe outcomes,
- collaborate and share ideas,
- develop confidence through experimentation.

---

4. Estimated Duration & Structure

Total duration: 60–90 minutes (flexible)

Suggested structure:

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- Introduction & safety briefing: 10 min
- Construction phase: 25–35 min
- Testing & experimentation: 20–30 min
- Discussion & reflection: 10–15 min

📌 Can be delivered as a **stand-alone workshop** or part of a larger STEM day.

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5. Materials Checklist

- Mini catapult construction materials
- Elastic or spring elements (safe strength)
- Soft, lightweight projectiles only
- Measuring tape or marked distance area
- Visual student scenario sheets

---

6. Space & Setup Tips

- Designate a **clear and safe testing zone**.
- Mark distances on the floor or table for observation.
- Ensure all participants stand behind the launch line.
- Prepare example catapult to demonstrate safe use.

---

7. Facilitation Tips

- Emphasise safety before experimentation.
- Encourage participants to change **one variable at a time**.
- Ask guiding questions instead of giving answers.
- Focus on learning, not on who launches further.
- Support teamwork and respectful discussion.

---

8. Inclusion & Accessibility Notes

- Flexible roles allow all participants to contribute.
- Avoid competitive pressure.
- Offer extra support during fine motor tasks.
- Allow observation before active participation if needed.

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9. Safety & Safeguarding Notes

- Use **only soft projectiles** (no hard objects).
- Maintain safe distances at all times.
- Supervise all launches closely.
- Stop the activity immediately if safety rules are not followed.
- Follow project safeguarding procedures.

10. Common Issues & Troubleshooting

- **Projectile does not travel far:** adjust tension or angle.
- **Catapult unstable:** reinforce base or supports.
- **Group conflict:** pause and reassign roles.
- **Limited time:** focus on one test and group reflection.

11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos and short videos (no faces without consent)
- Facilitator observation notes
- Short participant reflections

12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and can be implemented during:

- project mobilities,
- experimental STEM workshops,
- dissemination and demonstration events.

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Educator / Facilitator Guide

Rubber-Powered Jet

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Rubber-Powered Jet* activity helps participants explore **stored energy and motion** through a simple, hands-on flying construction.
It is short, highly engaging and ideal for **introducing physics concepts** in an accessible way.

This guide supports facilitators during implementation.

---

2. Target Group

- **Group size:** 8–15 participants
- **Working mode:** individual work or pairs
- **Experience level:** beginner-friendly, no prior STEM knowledge required

---

3. Learning Objectives

Facilitators support participants to:

- understand how **stored energy** is released as motion,
- observe cause–effect relationships through testing,
- build confidence through achievable construction tasks,
- experiment with small design changes,
- express creativity through personalisation.

---

4. Estimated Duration & Structure

Total duration: 45–60 minutes (flexible)

Suggested structure:

- Introduction & safety briefing: 5–10 min

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- Guided construction: 20–25 min
- Testing & experimentation: 10–15 min
- Sharing & reflection: 5–10 min

📌 Ideal as an **introductory** or **closing** activity within a mobility day.

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5. Materials Checklist

- Rubber-powered jet components
- Elastic rubber bands (safe strength)
- Lightweight body and wing materials
- Visual student scenario sheets
- Clear testing / launch area

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6. Space & Setup Tips

- Use a **clear, obstacle-free area** for test launches.
- Mark a simple launch line on the floor or table.
- Demonstrate one correct launch before participants start.
- Keep spare rubber bands available.

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7. Facilitation Tips

- Emphasise **controlled testing**, not distance.
- Encourage participants to change **one variable at a time**.
- Use guiding questions: *"What changed?" "Why do you think that happened?"*
- Celebrate curiosity and effort rather than performance.
- Keep the pace light and playful.

---

8. Inclusion & Accessibility Notes

- Simple materials make the activity accessible to all.
- Allow repeated attempts without pressure.
- Support participants who feel unsure about launching.
- Avoid competitive framing or comparisons.

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9. Safety & Safeguarding Notes

- Use **only lightweight, soft materials**.
- Supervise all launches closely.
- Ensure participants launch in the same direction.
- Maintain safe distances at all times.
- Follow project safeguarding procedures.

10. Common Issues & Troubleshooting

- **Jet does not move:** check rubber band attachment and tension.
- **Unstable flight:** adjust wing alignment or balance.
- **Participant frustration:** suggest smaller adjustments.
- **Limited time:** focus on one successful launch and reflection.

11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos and short videos (no faces without consent)
- Facilitator observation notes
- Short participant feedback

12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and can be implemented during:

- project mobilities,
- STEM discovery workshops,
- dissemination and family-friendly events.

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Educator / Facilitator Guide

Tiny Magnetic Motor

Project: *STEMpower Through Art* (Erasmus+ KA154-YOU)

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1. Activity Overview

The *Tiny Magnetic Motor* activity introduces young people to **basic principles of magnetism and electric motion** through a simple, hands-on construction.
It is designed to **demystify science**, spark curiosity and build confidence through immediate, visible results.

This guide supports facilitators during implementation.

---

2. Target Group

- **Group size:** 6–12 participants
- **Working mode:** individual work or pairs
- **Experience level:** beginner-friendly, ideal for first contact with science concepts

---

3. Learning Objectives

Facilitators support participants to:

- observe how magnetism and electricity create motion,
- explore cause–effect relationships through experimentation,
- follow step-by-step construction with confidence,
- describe scientific phenomena using their own words,
- develop curiosity and positive attitudes towards science.

---

4. Estimated Duration & Structure

Total duration: 2–3 hours (flexible)

Suggested structure:

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- Introduction & curiosity trigger: 10–15 min
- Guided assembly: 40–60 min
- Testing & experimentation: 30–40 min
- Creative decoration (optional): 20–30 min
- Sharing & reflection: 15–20 min

📌 This activity can also work as a **short science discovery station**.

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5. Materials Checklist

- Tiny magnetic motor components
- Magnets (safe size, age-appropriate)
- Copper wire and supports
- Batteries / power sources
- Visual student scenario sheets
- Optional decoration materials

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6. Space & Setup Tips

- Use tables with **good lighting** for small components.
- Prepare a **demonstration motor** in advance.
- Keep magnets and batteries organised and supervised.
- Allow participants to observe before building if they prefer.

---

7. Facilitation Tips

- Start with a short demonstration to create curiosity.
- Explain concepts through observation, not theory.
- Encourage participants to test small changes.
- Use questions like “What do you notice?” or “What changed?”
- Emphasise exploration, not technical perfection.

---

8. Inclusion & Accessibility Notes

- Allow observation-first participation.
- Support participants who feel unsure about “science”.

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- Use simple language and visual cues.
- Offer close mentor support for fine motor tasks.
- Avoid time pressure and competition.

---

9. Safety & Safeguarding Notes

- Supervise handling of magnets and batteries at all times.
- Ensure batteries are inserted correctly.
- Prevent magnets from being placed near electronic devices.
- Maintain continuous adult supervision.
- Follow project safeguarding procedures.

---

10. Common Issues & Troubleshooting

- **Motor does not spin:** check wire contact points and magnet position.
- **Weak movement:** adjust wire balance or battery connection.
- **Participant frustration:** pause, demonstrate again, encourage retry.
- **Limited time:** focus on observation rather than decoration.

---

11. Evidence to Collect (Erasmus+)

- Attendance list
- Photos and short videos (no faces without consent)
- Facilitator observation notes
- Short participant comments or reactions

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12. Link to Project Implementation

This activity is part of the **STEMpower Through Art** curriculum and is implemented during:

- project mobilities,
- science discovery workshops,
- dissemination and public demonstration events.

Funded by the European Union