SAINTS GLOBAL

LEADER GUIDE

3D PRINTING

INTELLECTUAL CORE

Version 2026.1

3D Printing

PURPOSE & IDENTITY

SKILL BADGE PURPOSE

To develop disciplined design thinking, digital fabrication skills, and ethical problem-solving through original 3D modeling, printing, testing, and iteration.

DEVELOPMENT CORE: INTELLECTUAL

This badge develops intellectual attributes through focused activities and reflection. Saints will grow in this area while building practical skills.

CORE FOCUSES

- Digital and physical safety in fabrication environments
- Design-for-manufacture and scale accuracy
- CAD modeling and slicing fundamentals
- Iterative prototyping and failure analysis
- Responsible use of technology and intellectual property
- Career awareness in additive manufacturing fields

TIME COMMITMENT	RECOMMENDED AGE
4-6 weeks (suggested)	13+

SAFETY CONSIDERATIONS

EQUIPMENT SAFETY

Hot ends, heated beds, and moving parts can cause burns or injury. Adult supervision and printer safety rules are required.

DIGITAL SAFETY

Use approved software and accounts; protect personal information and respect software licenses.

MATERIALS

Filaments, resins, and solvents must be handled according to manufacturer guidance with proper ventilation and PPE.

EMERGENCY CONTACTS

Troopmaster: _____

Emergency: _____

THE DPAR METHOD

Saints Global uses the DPAR method for skill badge completion. As a leader, you should practice DPAR yourself when preparing to teach.

D

DISCOVER

Learn foundational knowledge and concepts. Research, study, and explore the topic.

YOUR ROLE AS LEADER:

- Immerse yourself in the material before teaching
- Study each requirement—understand what AND why
- Anticipate questions saints might ask

P

PLAN

Create a personal action plan with goals and timeline.

YOUR ROLE AS LEADER:

- Design your teaching approach for each requirement
- Gather materials and prepare discussion questions
- Consider how to adapt for different learning styles

A

ACT

Execute through hands-on practice with leader guidance.

YOUR ROLE AS LEADER:

- Shift from teacher to guide—step back
- Create safe space for practice and mistakes
- Model the skills yourself when helpful

R

REFLECT

Review what was learned and share experiences gained.

YOUR ROLE AS LEADER:

- Facilitate meaningful conversations
- Ask open-ended questions, listen more than speak
- Celebrate growth and help saints see their progress

STEP 1: DISCOVER

LEADER PREPARATION

- [ ] Review all DISCOVER requirements thoroughly
- [ ] Gather necessary resources and materials
- [ ] Prepare discussion questions and activities
- [ ] Identify potential challenges saints may face

STEP 1: DISCOVER — TEACHING GUIDE

Requirement 1a: Explain why safety matters in 3D printing, including tool safety, digital safety, and precautions when using heated or hazardous materials.

HOW TO TEACH

- Tour a printer and identify hazard zones
- Discuss burn risks and ventilation needs
- Review safe digital behavior and file sources
- Connect safety to stewardship and responsibility

Completion: Saint clearly explains safety rules and why each matters.

Requirement 1b: Explain different types of models (architectural, mechanical, process, industrial) and how 3D printing supports each.

HOW TO TEACH

- Use real printed examples or images
- Match model type to real-world use
- Discuss limits of scale and material
- Emphasize function over appearance

Completion: Saint accurately explains model types and applications.

STEP 2: PLAN

LEADER PREPARATION

- [ ] Review all PLAN requirements thoroughly
- [ ] Gather necessary resources and materials
- [ ] Prepare discussion questions and activities
- [ ] Identify potential challenges saints may face

STEP 2: PLAN — TEACHING GUIDE

Requirement 2a: Design an original 3D-printable model (not from a kit) using CAD software, scaled appropriately for its purpose.

HOW TO TEACH

- Require the Saint to sketch before modeling
- Discuss tolerances and wall thickness
- Explain how scale affects strength and print time
- Review design before printing

Completion: Saint presents a complete, scaled design plan.

Requirement 2b: Explain how CAD, slicing software, and the printer work together from design to finished object.

HOW TO TEACH

- Trace the workflow step by step
- Explain G-code at a conceptual level
- Discuss common slicing settings
- Relate software decisions to print outcomes

Completion: Saint explains the digital-to-physical workflow clearly.

STEP 3: ACT

LEADER PREPARATION

- [ ] Review all ACT requirements thoroughly
- [ ] Gather necessary resources and materials
- [ ] Prepare discussion questions and activities
- [ ] Identify potential challenges saints may face

STEP 3: ACT — TEACHING GUIDE

Requirement 3a: Print the designed model and demonstrate proper printer setup, operation, and shutdown under supervision.

HOW TO TEACH

- Observe preparation steps closely
- Emphasize monitoring the first layers
- Stop the print if unsafe behavior occurs
- Reinforce care for shared equipment

Completion: Saint safely completes a supervised print.

Requirement 3b: Evaluate the printed model for accuracy, strength, and fit, then revise the design or settings and reprint if needed.

HOW TO TEACH

- Teach failure as feedback, not error
- Require evidence-based adjustments
- Compare first and second prints
- Discuss cost and time tradeoffs

Completion: Saint analyzes results and explains improvements.

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STEP 3: ACT — TEACHING GUIDE (CONTINUED)

Requirement 3c: Explain intellectual property considerations in 3D printing, including file licensing, remixing, and responsible sharing.

HOW TO TEACH

- Compare original vs downloaded models
- Explain licenses at a practical level
- Discuss ethical remixing and attribution
- Connect IP respect to integrity

Completion: Saint explains IP rules and ethical use clearly.

STEP 4: REFLECT

LEADER PREPARATION

- [ ] Review all REFLECT requirements thoroughly
- [ ] Gather necessary resources and materials
- [ ] Prepare discussion questions and activities
- [ ] Identify potential challenges saints may face

STEP 4: REFLECT — TEACHING GUIDE

Requirement 4a: Explain what you learned about design thinking, iteration, and responsibility through this project, and identify one improvement you would make next time.

HOW TO TEACH

- Ask for a specific challenge encountered
- Discuss how planning reduced mistakes
- Encourage honest assessment
- Tie reflection to future growth

Completion: Saint reflects with specific examples and insights.

Requirement 4b: Identify three careers related to 3D printing or digital fabrication and explain the training required for one.

HOW TO TEACH

- Include engineering, manufacturing, medical, and design roles
- Discuss education, certifications, and portfolios
- Connect careers to badge skills
- Encourage next exploratory steps

Completion: Saint explains three careers and one in detail.

RESOURCES & CONTACT

RECOMMENDED RESOURCES

- **Saints Global Resource Library** — Online materials and guides
- **DPAR Method Quick Reference** — Printable guide for leaders
- **Child and Youth Program Guidebook** — LDS Church Official Documentation for Children and Youth
- **For the Strength of Youth** — A Guide for Making Choices

SAINTS GLOBAL CONTACT INFORMATION

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Thank you for leading Saints Global!

Your dedication makes a difference in the lives of our children and youth.