Summer Study Plan: AMC 12 and STEP (10 Weeks)

Overview

- **Weeks 1–2:** Quick Review of Key Concepts from AoPS Volume 1 (skim + brief notes)
- **Weeks 3–4:** Intermediate Topics + Intro to STEP Thinking (selective use of AoPS Volume 2)
- **Weeks 5–6:** AMC Sprint + STEP II Practice
- **Weeks 7–8:** Geometry & Proof Mastery
- **Weeks 9–10:** Simulation & Final Review

Daily Study Schedule (Detailed by Key Days)

Week 1

Day	Activity
Mon	Skim AoPS Vol. 1 Ch. 1 (Algebra); take 1-page notes; solve 3 AMC Algebra problems (Q10–20)
Tue	Skim Ch. 2 (Number Theory); take 1-page notes; solve 3 AMC NT problems (Q10–22)
Wed	Skim Ch. 3 (Counting); take notes; solve 4 AMC C&P problems (Q12–23)
Thu	Skim Ch. 4 (Geometry); 1-page notes; solve 3 AMC Geometry problems (Q10–20); write 1 proof
Fri	Mixed AMC set: 5 problems (one per core topic); log mistakes
Sat	Review notes; write 1-paragraph summaries per topic; revise 1 solution from earlier

---

Week 2

Day	Activity
Mon	Deep dive on divisibility and primes; solve 4 AMC NT problems (Q15–25)
Tue	Focus on angles, triangles, and cyclic quads; 4 AMC Geometry problems (Q14–23)
Wed	Revisit two weakest topics; solve 2 problems each; annotate insights
Thu	AMC mini test: 6 hard problems (Q18–25); 60 minutes; analyze mistakes
Fri	Choose the hardest problem this week; journal full solution + alt. method
Sat	Build formula sheet: basic identities, NT tricks, key geometry facts

---

Week 3

Day	Activity
Mon	Read AoPS Vol. 2: Algebra intro (max 5 pages); solve 1 full STEP algebra problem (~40 min)
Tue	STEP algebra Q (e.g., binomial); 3 AMC Algebra problems (Q15–24); update error log

Day	Activity
Wed	Read Vol. 2: Functional Equations (~5 pages); solve 1 AMC + 1 STEP problem
Thu	Solve 1 STEP Q (inequalities or transformations); journal key strategy
Fri	AMC mini test (8 Qs Q15–25); 75 mins; write short test strategy review
Sat	Reflect on top 3 error types; rework one example each in journal

Week 4

Day	Activity
Mon	Read PIE section (max 6 pages); solve 2 AMC PIE problems (Q15–22)
Tue	Solve 1 STEP inequality Q + annotated write-up
Wed	AMC timed set (10 Qs Q16–25); classify by topic/difficulty
Thu	Solve STEP combinatorics problem (e.g., bounding); journal insight
Fri	Reflective writing: list 3 recurring problem-solving techniques
Sat	Review hardest problems (2 AMC + 1 STEP); identify transferable ideas

Week 5

Day	Activity
Mon	Full AMC test (25 Qs, 75 min); error tagging and review
Tue	Drill: 4 AMC Qs <5 min each (Q10–18), 2 Qs >15 min (Q20–25)
Wed	AMC set (Q16–25); full journal write-up of one difficult Q
Thu	Drill: 6 AMC Qs (Q15–23); mark careless vs conceptual errors
Fri	Targeted review: 2 weakest areas; 3 problems each
Sat	Write 1-page summary: 3 recurring mistake types + avoidance strategies

Week 6

Day	Activity
Mon	2 STEP Algebra problems (90 mins total); reflect on Vol. 2 methods
Tue	Solve 1 full STEP Q; detailed write-up with footnotes
Wed	AMC Qs (Q16–25); checklist: misread, algebra error, logic flaw?
Thu	STEP sequence or logic Q; focus: structural technique (e.g., invariants)
Fri	Full reflection: How has your approach evolved?

Day	Activity
Sat	Optional: pick 2 AMC Qs from log; explain solutions aloud or to peer

Week 7

Day	Activity
Mon	AMC Geometry drill: 3 triangle Qs, 2 circle Qs; read 3 pages Evan Chen notes
Tue	STEP coordinate geometry Q (e.g., parabola-line); journal diagram approach
Wed	Solve 2 AMC + 1 STEP geometry Qs; compare structures
Thu	Vector geometry: 2 problems using dot product or projections
Fri	Update error log; tag new problem types; 1-page geometry review
Sat	Make flashcards: definitions, common configs, key theorems

Week 8

Day	Activity
Mon	Annotated proof: 1 classic STEP Q (e.g., contradiction or induction)
Tue	3 AMC Qs (Q20–25); reflect on tricks used in each
Wed	Solve 2 AMC + 1 STEP using construction or casework
Thu	2 mixed STEP Qs (1 geometry, 1 inequality); journal: which felt intuitive
Fri	Write personal strategy guide: 5 tactics + worked examples
Sat	Light review: scan notes; highlight polish targets for next 2 weeks

Week 9

Day	Activity
Mon	Full AMC mock (75 min); mark time per question + confidence
Tue	Re-solve mistakes; journal new types of errors
Wed	STEP session (90 min, 2 Qs); partial solves OK
Thu	Review hardest STEP topic (e.g., proof writing)
Fri	Journal: assess preparedness; plan final review priorities
Sat	Build a test-eve checklist: formulas, tactics, question types

Week 10

Day	Activity
Mon	AMC mock (recent test); log time/question
Tue	Review thoroughly; journal reflection: “What would I do differently?”
Wed	Solve 1 full STEP problem (real past paper); clean full solution
Thu	Make summary sheet: theorems, tricks, identities, strategies
Fri	Review full error log; re-solve 5 most challenging problems
Sat	Light review; rest; reread favorite proof journal entries

---

Notes & Journal System

1. **Proof Journal**
   - Write 1 full problem solution daily (AMC or STEP).
   - Include: problem, clean solution, and strategic reflection.
   - Tag entries by topic (e.g., Geometry, Inequalities).
2. **Error Log**
   - Record every missed problem: source, topic, mistake type, and correct solution.
   - Review weekly to identify patterns or conceptual gaps.
3. **Concept Notes**
   - Organize notes by subject: Algebra, Geometry, Number Theory, Combinatorics.
   - Include key theorems, techniques, and example problems.
   - Use highlighting to differentiate formulas, strategies, and common pitfalls.

How to Find AMC Problems by Topic

1. **AoPS Wiki**
   - Use the AoPS Wiki to browse topics and sample problems.
2. **AoPS Problem Search Tool**
   - Use the AoPS Problem Search to filter by contest, topic, and question range (e.g., Geometry, AMC 12, Q15–25).
3. **Alcumus & AoPS Books**
   - Alcumus offers adaptive topic-based AMC practice.
   - Use end-of-chapter problems from AoPS books, tagging by topic if needed.

Recommended Resources

- Art of Problem Solving Volume 1 & 2 (skim strategically; focus on worked examples)
- Evan Chen Geometry Notes (for advanced techniques)
- STEP: Advanced Problems in Core Mathematics by Stephen Siklos
- MEI STEP Support Materials + Cambridge STEP Archives

Study Commitment

- **Time:** ~3 hours per day, 6 days per week
- **Total Duration:** 10 Weeks