Education & Learning / Memory Systems

Predict when knowledge will decay and schedule timely reviews — decay prediction for proactive retention.
Difficulty: Advanced
Model: GPT-4 / Claude / Gemini
Use Case: Retention Prediction, Review Scheduling
Updated: June 2026
Why This Prompt Exists
Memory decays exponentially after learning. Without tracking, you don’t know when you’re about to forget. Most learners review too late — after memory has already decayed.

You get:

- reviewing after forgetting (have to relearn, not just reinforce)
- no prediction of when you’ll forget (reactive, not proactive)
- wasted reviews (too soon or too late)
- no visibility into retention strength
- inability to prioritize which items need review

But forgetting curves are predictable:

- Ebbinghaus curve: exponential decay, steepest initially
- retention after 1 day: ~50-80% (varies by material)
- retention after 2 days: ~40-70%
- retention after 6 days: ~30-60%
- retention after 30 days: ~20-40%
- each review flattens the curve

Without tracking, you don’t know what you’re about to forget.

This prompt predicts forgetting and schedules proactive reviews.

The Prompt

```
Assume the role of a memory researcher who tracks and predicts
forgetting curves.

Your task is to predict when knowledge will decay and schedule reviews
before forgetting occurs.

Generate:

1. LEARNING EVENT DATA
   - Material: [what was learned]
   - Initial learning date: [date]
   - Initial recall success: [100% / high / medium / low]
   - Material difficulty: [easy / medium / hard]
   - Reviews completed: [list of review dates and success rates]

2. FORGETTING CURVE PREDICTION

| Days Since Learning | Predicted Retention | Review Needed? |
Confidence |
|---------------------|---------------------|----------------|---------
---|
| Day 0 (initial) | 100% | No | High |
| Day 1 | [75-85%] | Yes (if retention <90%) | High |
| Day 3 | [60-75%] | Yes | Medium |
| Day 7 | [50-65%] | Yes | Medium |
```

| Day 14 | [40-55%] | Yes | Low |
| Day 30 | [30-45%] | Yes | Low |

3. RETENTION THRESHOLDS

| Review Type | Trigger Retention | Action |
|---|---|---|
| Immediate review | <90% | Same day |
| Short-term review | <80% | Within 24 hours |
| Medium-term review | <70% | Within 3 days |
| Long-term review | <60% | Within 7 days |
| Mastery check | <50% | Relearn, then resume spacing |

4. REVIEW SCHEDULE (proactive, before forgetting)

| Review # | Optimal Timing | Your Schedule | Predicted Retention Before Review |
|---|---|---|---|
| 1 | 1 day after learning | [date] | ~50-80% |
| 2 | 3 days after learning | [date] | ~60-75% |
| 3 | 7 days after learning | [date] | ~50-65% |
| 4 | 14 days after learning | [date] | ~40-55% |
| 5 | 30 days after learning | [date] | ~30-45% |
| 6 | 60 days after learning | [date] | ~25-35% |

5. RETENTION STRENGTH TRACKER

| Item | Initial Strength | Current Strength (after reviews) | Decay

Rate | Next Review Due |
|---|---|---|---|---|
| [item 1] | [100%] | [X%] | [fast/med/slow] | [date] |
| [item 2] | [100%] | [X%] | [fast/med/slow] | [date] |

6. ADAPTIVE INTERVALS BASED ON REVIEW PERFORMANCE

| Review Score | Interval Adjustment | Next Interval |
|---|---|---|
| 100% (perfect) | Multiply by 2 | 2x previous |
| 80-99% | Multiply by 1.5 | 1.5x previous |
| 60-79% | No change | Same interval |
| 40-59% | Multiply by 0.75 | Shorter interval |
| <40% | Reset to day 1 | Restart spacing |

7. FORGETTING CURVE PARAMETERS BY MATERIAL TYPE

| Material Type | Initial Decay Rate | Stabilization Point | Review Sensitivity |
|---|---|---|---|
| Facts (random) | Fastest | Lowest | High |
| Vocabulary | Fast | Low | High |
| Concepts (understood) | Medium | Medium | Medium |
| Procedures (practiced) | Slow | High | Low |
| Skills (physical) | Slowest | Highest | Lowest |

8. COMMON FORGETTING CURVE MISTAKES

| Mistake | Why It Fails | Correct Approach |
|---|---|---|
| Reviewing too late | Memory already decayed | Review at 80-90% retention |
| Reviewing too soon | Wasted effort | Wait until just before forgetting |
| Fixed intervals for all | Ignores individual differences | Adapt based on performance |
| No retention measurement | Can't calibrate | Test before scheduling |
| Ignoring material type | Wrong decay model | Match parameters to content |

INPUTS:

Material learned:
[PASTE DESCRIPTION]

Initial learning date:
[PASTE DATE]

Initial recall success:
[HIGH (90-100%) / MEDIUM (70-90%) / LOW (<70%)]

Material difficulty:
[EASY / MEDIUM / HARD]

Review history (if any):
[PASTE REVIEW DATES AND SCORES]

```
RULES:
- First review within 24 hours of learning (critical window)
- Review when predicted retention is 80-90% (optimal difficulty)
- Double interval after perfect recall (100% score)
- Shorten interval after poor recall (<60% score)
- Track retention strength per item (not just overall)
- Material type affects decay rate (facts decay faster than skills)
- Test before scheduling next review (measure retention, don't assume)
```

How To Use It

- First review within 24 hours of learning — the critical window for consolidation.
- Review when predicted retention is 80-90% — optimal difficulty for strengthening memory.
- Double interval after perfect recall — 100% score means the memory is strong; space it out.
- Shorten interval after poor recall — less than 60% means review too late or material too hard.
- Track retention strength per item — not just overall; different items decay at different rates.
- Material type affects decay rate — facts decay faster than understood concepts; skills decay slowest.
- Test before scheduling the next review — measure retention, don't assume it.

Example Input

**Material learned:** "50 Spanish vocabulary words (basic nouns)"

**Initial learning date:** "June 1, 2026"

**Initial recall success:** "MEDIUM (80% on first test)"

**Material difficulty:** "MEDIUM"

**Review history:** "Reviewed June 2 (90% recall), June 5 (85% recall)"

Why It Works
Without tracking, learners review too late — after memory has already decayed, requiring relearning, not just reinforcement.

This framework improves outcomes by forcing:

- forgetting curve prediction (predicting when memory will decay)
- retention threshold setting (triggering review at optimal times)
- proactive scheduling (reviewing before forgetting, not after)
- adaptive interval adjustment (tailoring spacing to performance)
- material-type parameter matching (facts decay faster than skills)

**Failure modes this prevents:**

- reviewing after forgetting (relearning wasted time)
- no prediction of decay (reactive, not proactive)
- wasted reviews (too soon or too late)
- no visibility into retention strength
- inability to prioritize which items need review

**This improves on:** Fixed-interval review. Adaptive, predicted scheduling reviews at the optimal moment — just before forgetting.

**Related to:** MS-01 (Spaced Repetition) for intervals; MS-03 (Retrieval Practice) for recall measurement.

## Build Better AI Systems

Subscribe for advanced prompt engineering, AI coding tools, debugging frameworks, and practical strategies for developers and engineers.

Carefully engineered prompts for people doing real work.

### Share this:

- Share on Facebook (Opens in new window) Facebook
- Share on X (Opens in new window) X

See also Mnemonic Generator