Pencil Galaxy Drawing: Star Placement, Spiral Shading, and Tonal Blending

Original tasks 1, 2, 3 / complete keys

Task 1

A 4 by 4 grid has 3 stars in each of the four center cells and 1 star in each of the twelve outer cells. How many stars total? Describe where the darkest tone should go.

Answer: Center stars: 4 times 3 equals 12. Outer stars: 12 times 1 equals 12. Total equals 24 stars. The darkest tone goes in the center cells.

Reason: Multiply center cell count by 4 and outer cell count by 12, then add. The center is the darkest area by the tonal plan.

Check: Recount: 12 plus 12 equals 24. Confirm the center is marked darkest on your tonal scale.

Task 2

You draw three spiral guide curves. Two rotate clockwise and one rotates counterclockwise. What is wrong, and how do you fix it without erasing all three?

Answer: The spiral direction is inconsistent. Redraw the counterclockwise guide so it rotates clockwise, matching the other two.

Reason: All arms must rotate the same way for a coherent spiral. Fixing one guide preserves the others.

Check: Trace each guide from center to edge and confirm all three turn clockwise.

Task 3

Your tonal scale has four steps: light, medium-light, medium, dark. You plan three steps for the galaxy. Which steps should the center, mid arm, and outer arm use?

Answer: Center uses dark, mid arm uses medium, outer arm uses medium-light or light. Any three consecutive steps are valid if the center is darkest.

Reason: Depth is suggested by stepping tones from dark center to light edges. Three distinct steps are required.

Check: Compare each arm to the scale and confirm three different labels appear, with dark at center.

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Original tasks 4 / complete keys

Task 4

After blending, two adjacent arms look the same gray. You want to separate them. Name two checkable actions using your tonal scale.

Answer: Darken the center or inner part of one arm by one step, and lighten the outer part of the other arm by one step. Then compare both to the scale.

Reason: Increasing tonal difference separates arms. Using the scale keeps changes checkable.

Check: Label each arm's tone against the scale and confirm they now differ by at least one step.

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Source rubric / reflection

- [ ] Star placement uses a grid plan with checkable counts per cell.
- [ ] Spiral arms rotate consistently in one direction.
- [ ] At least two distinct tonal steps are visible per arm.
- [ ] Center is darker than outer edges after blending.
- [ ] Grid lines are erased or faint in the final drawing.
- [ ] No planets, black holes, or color are included.
- [ ] Valid alternatives such as different star counts or arm numbers are accepted if checks pass.

Reflection: What did you check, what did you change, and what will you try next?