

Ants in Space

How to Build an Ant Habitat

by

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College of
Medicine

Baylor College of Medicine

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Printed in the United States of America.

ISBN-13: 978-1-888997-88-0

BioEdSM

Teacher Resources from the Center for Educational Outreach at Baylor College of Medicine.
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Designer: Martha Young, B.F.A.

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ACKNOWLEDGMENTS

The authors gratefully acknowledge the support of William A. Thomson, Ph.D., Professor and Director, Center for Educational Outreach, Baylor College of Medicine. We especially acknowledge the valuable contributions of Michael Greene, Ph.D., at the University of Colorado Denver, Louis Stodieck, Ph.D., of BioServe Space Technologies (University of Colorado), and Diane Matthews, STEM Education, Center for the Advancement of Science in Space.

This work was funded by grant number GA-2013-108 from the Center for the Advancement of Science in Space, Inc., (CASIS) through NASA funded Cooperative Agreement Number NNH11CD70A.

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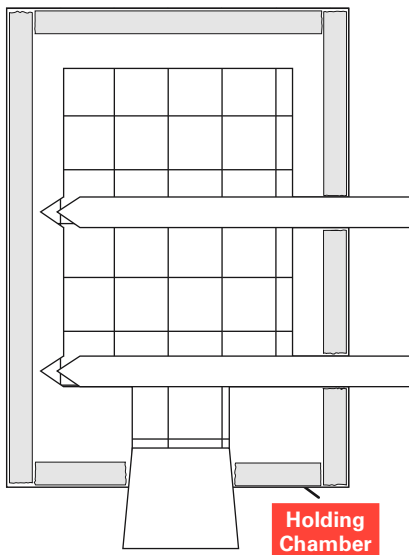
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How to Build an Ant Habitat

ANT HABITAT



MATERIALS TO MAKE ONE HABITAT

- 12-in. x 18-in. sheet of craft foam, 5 mm in thickness (for example, Silly Winks foam sheets); available at craft stores or online
- Double-sided tape (clear)
- 5-in. x 7-in. (13 cm x 18 cm) sheet of clear acrylic (plastic) for picture frame glazing; available at craft stores. (Transparency film may be substituted, but use care to seal it tightly to the habitat.)
- Copy of “Habitat Pattern” page
- Pair of scissors
- Ruler marked in centimeters
- Fine tip marker pen or ball point pen

Optional: Glue stick, razor knife, straight edge, cutting board

Students will be able to formulate and ask their own questions about ant behavior, or conduct experiments that match those on the International Space Station. The plans below describe how common materials can be used to construct an inexpensive, ground-based ant habitat similar in size and design to the ant chambers aboard ISS. To view a video showing how to build the habitat, visit the Ants in Space page on BioEd Online (<http://www.bioedonline.org/lessons-and-more/resource-collections/experiments-in-space/ants-in-space/>).

A crucial feature of both space- and Earth-based habitats is the capacity to increase the size of the foraging area. Initially, the ants are placed in a small holding chamber. In stage one of the investigation, the first of two sliding partitions (doors) is opened, allowing the ants to enter Search Area 1. Students will observe how ants behave in this relatively confined space. In stage two, the door to Search Area 2 is opened, effectively doubling the space available to the ants. Students again will observe the ants, now at lower population density as they spread out to explore this larger area. Students will be able to compare ants’ search/exploration behavior during stage two to the behavior exhibited in the higher population-density environment of stage 1.

Procedure

1. Cut a 5-in. by 7-in. (127-cm x 178-mm) rectangle from the sheet of craft foam. This rectangle will serve as the base of the chamber. With the ruler and marker, draw a 2-cm grid on one side of the sheet.

If you teach older students or will be observing very small ants, use a 1-cm grid instead.

2. Use the remaining sheet of craft foam for cutting out the frame and doors of the habitat (see “Habitat Pattern,” p. 11). Place the pattern over the remaining foam, and secure it in place with tape (or a light coating of glue from a glue stick). Using scissors or a razor knife and straight edge, carefully cut out each piece, discarding the “gray” areas on the pattern. Alternatively, cut out the pattern and trace it on the sheet of foam before cutting out the pieces.
3. Position the base with the grid side up. Reassemble each pattern piece over the base. Using double-sided tape, fasten the three frame pieces to the base of the habitat (see “Habitat Base and Frame,” p. 12).
Important: Do not glue or tape pieces 4, 5 and 6; they must be able to slide. Also, do not distort the frame as you press it into place. It must fit snugly around the three sliding doors, with no gaps through which ants might escape.
4. Use double-sided tape to fasten the glaze or transparency sheet firmly over the top of the assembled foam. Do not tape doors (see “Completed Habitat,” p. 4). ■

Habitat Pattern

1. Make precise cuts on the solid lines to ensure a snug fit for habitat doors.
2. Discard pieces marked in gray. The frame will have notched areas corresponding to the shape of the sliding doors.

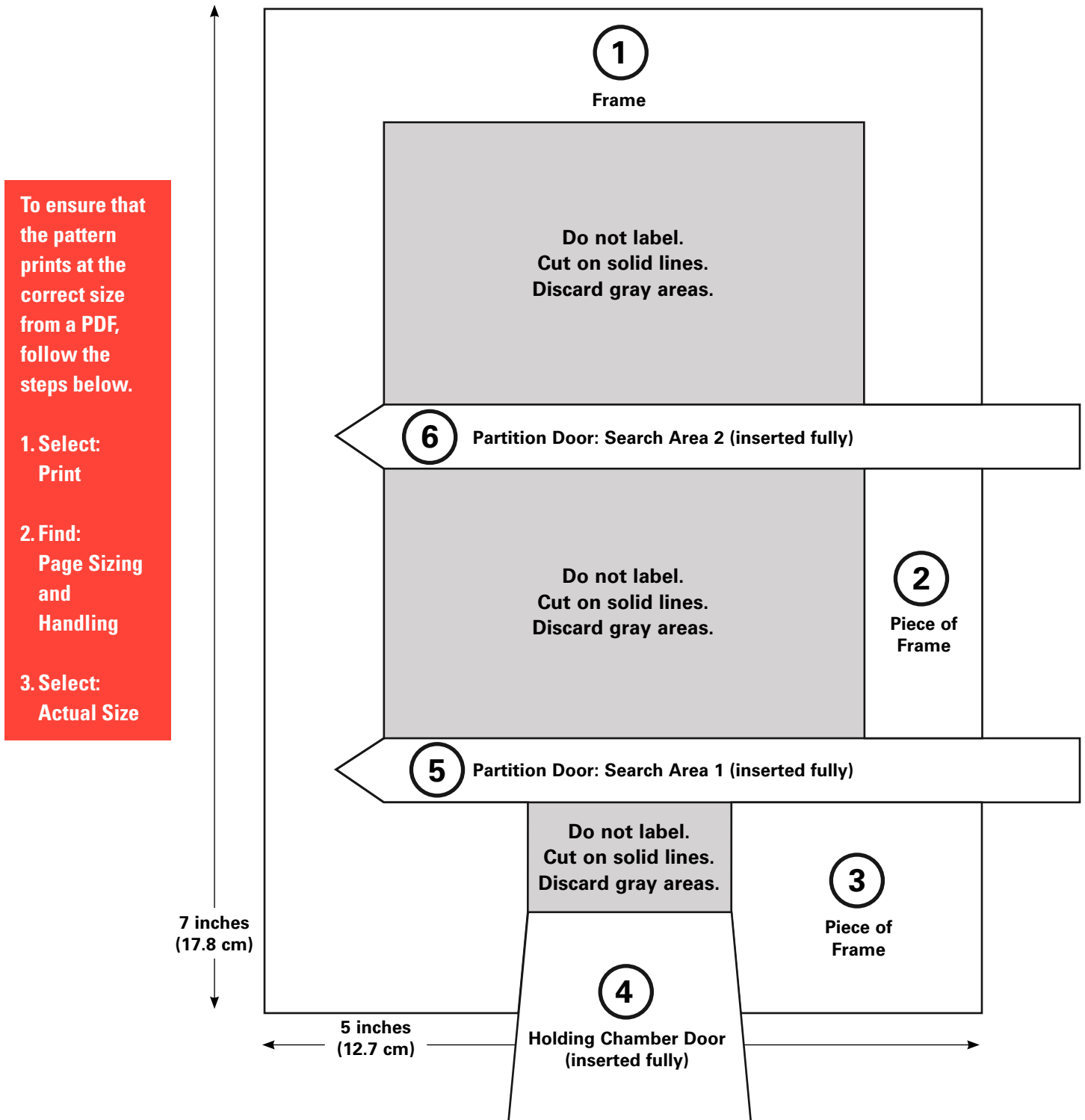
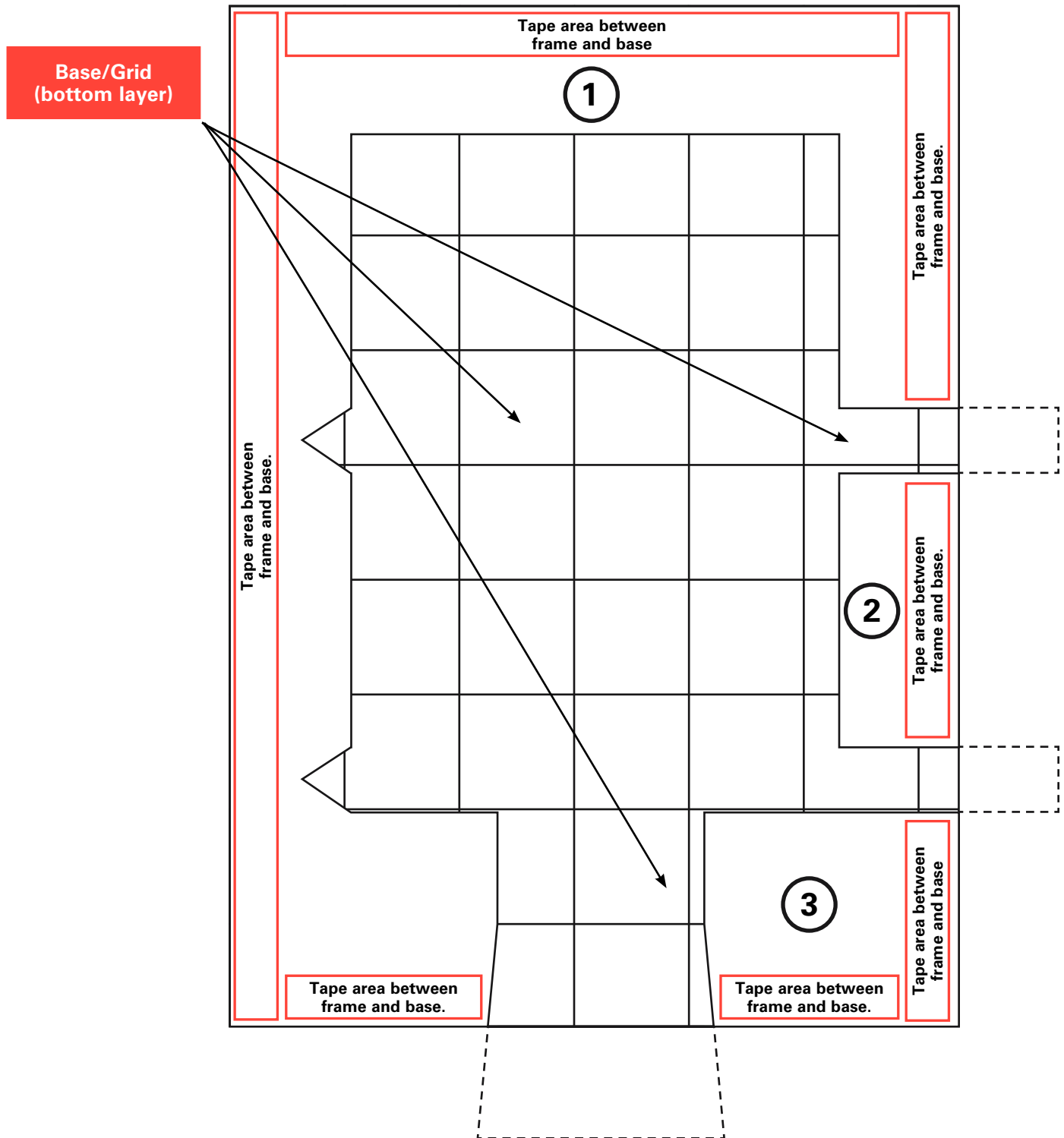


Illustration by G.L. Vogt, EdD, and M.S. Young.

Habitat Base and Frame

1. Reassemble each pattern piece over the base (doors removed to show taping areas).
2. Place double-side tape between the frame (pieces 1, 2 and 3) and the base, without placing tape beneath door areas. Press the pieces firmly into place without distorting the frame. Once in place, the sliding doors must fit snugly into the frame with no gaps through which ants might escape.



Completed Habitat

1. Use double-sided tape (shown in gray below) to fasten the sheet of clear acrylic plastic (or transparency film) firmly over the top of the assembled habitat. Do not place tape over the sliding doors (pieces 4, 5 and 6).
2. Slide both partition doors firmly into place prior to loading ants into the habitat.

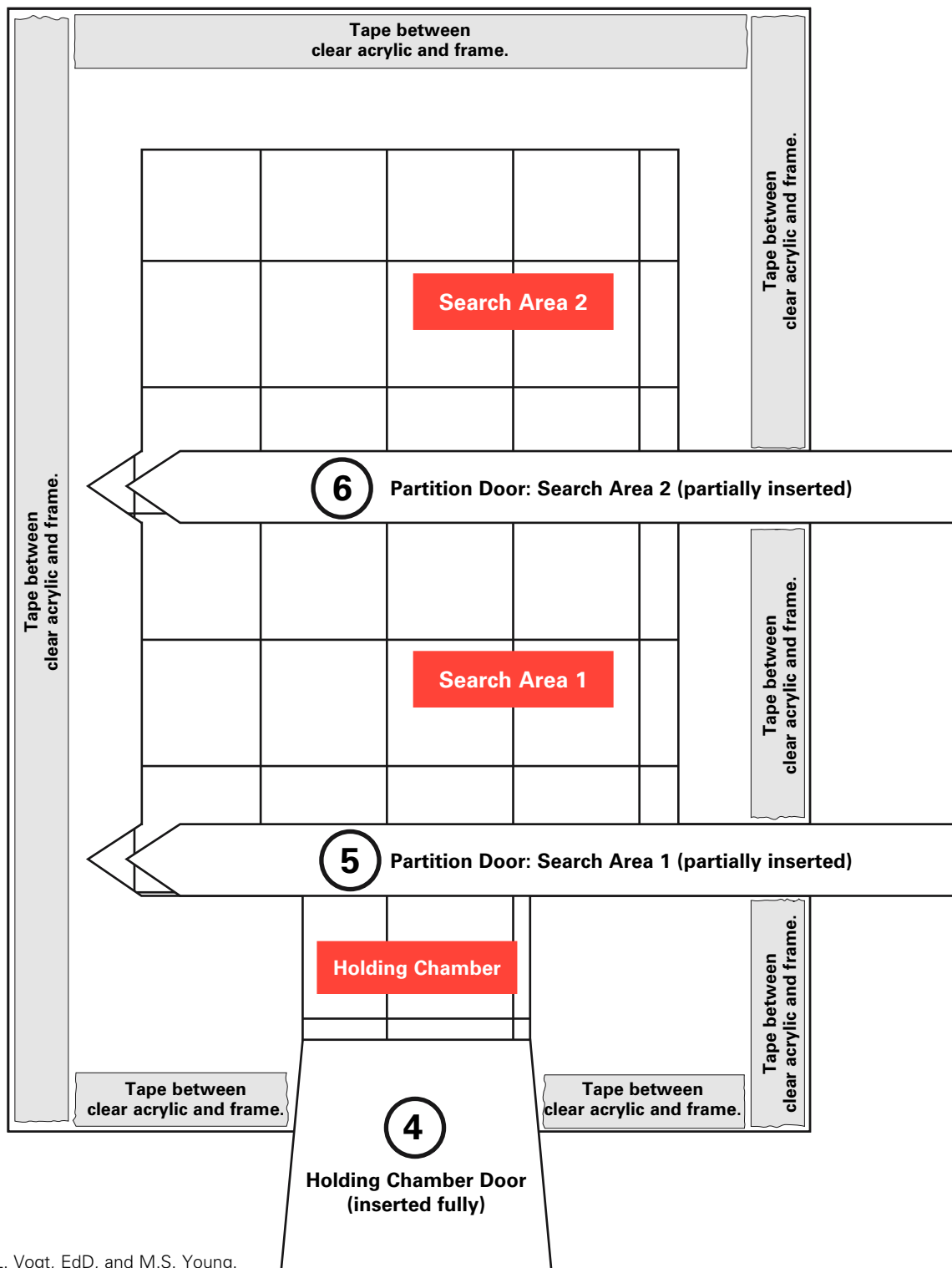


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