Bumble Bee Nightlight – 3 Techniques

Transform a simple pattern to accommodate a variety of techniques. Students can choose to mosaic, fuse or solder their nightlights – whichever method they prefer. To stretch your budget, encourage students to create their own designs in lieu of using pre-cut shapes.

Materials:

Fusing Method:
- Clear Glass (Item #X1002M)
- Frit (Item #XF4212, XF23353 & XF1701)
- Pre-Cut Bumble Bee (Item #X30315)
- Bullseye Thin Fire Shelf Paper (Item #7405)
- Night Light (Item #702850)
- Night Light Clip (Item #702950)
- Adhesive (Item #65104 or 8918)

Mosaic Method:
- Clear Glass (Item #M3905)
- Mosaic Glass Chips (Item #425361B)
- Pre-Cut Bumble Bee (Item #X30315)
- White Sanded Grout (Item #201868)
- Night Light (Item #702850)
- Night Light Clip (Item #702950)
- Adhesive (Item #65104)
- Grout Sealer (Item #20110)

Stained Glass Method:
- Pre-Cut Bumble Bee (Item #X30315)
- Solder (Item #3000)
- Flux (Item #96102 or 5527)
- Copper Foil (Item #425681)
- Flux Remover (Item #5514)
- Polishing Compound (Item #9432)
- Night Light w/ Shepherds Hook (Item #171277)
Fused Project Instructions:

1. Cut a piece of fusible glass to use as the base for your fused piece. Transparent glass works well, since it will let the night light shine through.
2. Using rubbing alcohol, clean your base glass and your precut glass. Lay out the precut glass on the base piece. (A)
3. Choose the color(s) of frit you want to use to fill in the rest of the base piece. Using a scoop or plastic spoon, tap the frit onto the base piece around the precut glass. If any frit ends up on top of the precut, use a small brush to gently move the frit off of it. (B)
4. To add lines of frit detail, create some crevices to be filled using tweezers or a toothpick. Scoop powder frit into a small enamel sifter. Using a brush handle or pencil, rub the textured portion of the handle to begin the frit flowing from the sifter. You can also tap, shake or use the coil actuator to control the flow of the powder frit. (C)
5. Mound the frit away from the edges, so that when it is fired, the molten glass will flow evenly.
6. Prepare your kiln shelf with either kiln wash or a piece of shelf paper. Carefully place your project on the prepared shelf and place the shelf in the kiln.
7. Use the following firing schedule for results similar to our project example. (See below.)
8. Using a silicone adhesive, E6000 or Weldbond glue, affix the night light clip to the bottom of the back of the fused piece. Allow to dry thoroughly before placing the clip on the nightlight fixture.

Suggested Fusing Schedule: (for 96 COE)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Rate (Ramp)</th>
<th>Temperature</th>
<th>Hold (soak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>300°F/hr</td>
<td>1100°</td>
<td>15 min.</td>
</tr>
<tr>
<td>2</td>
<td>250°F/hr</td>
<td>1275°</td>
<td>10 min.</td>
</tr>
<tr>
<td>3</td>
<td>300°F/hr</td>
<td>1400°</td>
<td>5 min.</td>
</tr>
<tr>
<td>4</td>
<td>Full</td>
<td>950°</td>
<td>20 min.</td>
</tr>
</tbody>
</table>

This fusing schedule will give the project rounded corners, but the bee will remain slightly raised. Adjustments can be made according to your preference and the regularity of your kiln.

MATERIALS COST PER PROJECT (Based on Fused Bee Night Light)

- Clear Ultra Smooth Glass Thin - $0.60
- Frit - $1.93
- Pre-Cut Bumble Bee* - $6.86
- Bullseye Thin Fire Shelf Paper - $0.24
- Night Light - $1.04
- Night Light Clip - $0.28

TOTAL COST PER STUDENT: $10.95*  
(Pricing based on 2012-2013 catalog)

Per project cost based on 1/9 of 12” x 12” X1002M Clear Glass, 2 oz. frit, and 1/16 sheet of shelf paper.

*Greatly reduce the cost of the project by replacing the pre-cut bee with student cut designs.
Mosaic Project Instructions:
1. Cut a piece of transparent glass to use as your base surface.
2. Apply a layer of Weldbond to the glass to create a good surface on which to build your mosaic. Allow it to dry thoroughly. It may take 2-3 days for the glue to dry completely clear. A little Weldbond goes a long way.
3. Using wheeled nippers and stained glass chips, nip the glass into the size pieces you want to use for your piece. Hint: Lay out your design on your base piece of glass before gluing. Leave approximately ¼" around the outside of your glass pieces to allow space for the grout.
4. Affix the precut and pieces of glass on to the base piece one at a time, using a thin even layer of Weldbond on each piece. Continue until all of the pieces are glued down. Allow the project to dry overnight.
5. Using your prepared grout (refer to grout prep instructions) apply grout using a small spatula. Push grout into spaces between glass and spread around evenly. Use spatula to create a “beveled” edge around the outside of the piece.
6. Wait 15-20 min. for grout to set. Brush away excess grout using a towel or brush. It is very important to remove grout from surface of the glass before it dries. Use care not to disturb the grout that is between pieces. (Repeat steps 5 and 6 if grout is not level with glass after drying.) Allow grout to dry at least 24 hours.
7. Apply first coat of grout sealer to surface using a soft bristled brush. Allow sealer to absorb into grout for approximately 5-15 min. Apply second coat.
8. Once grout sealer is dry, wipe up sealer from the surface of the glass using a clean dry lint-free cotton towel.
9. Using a silicone adhesive, E6000 or Weldbond glue, affix the night light clip to the bottom of the back of the mosaic piece. Allow to dry thoroughly before placing the clip on the nightlight fixture.

Grout Prep Instructions:
(Refer to step 5 - mix grout immediately before use.)
1. Pour grout into a mixing bowl.
2. Adding a small amount of water at a time, mix until the grout is the consistency of brownie batter.
3. Approximate ratio is 3 parts grout to 1 part water.

PLEASE NOTE: When working with grout, a dust mask and protective gloves should be worn. Never pour grout down a drain.

MATERIALS COST PER PROJECT
(Based on Mosaic Bee Night Light)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear Float Glass</td>
<td>$.34</td>
</tr>
<tr>
<td>Mosaic Glass Chips</td>
<td>$1.00</td>
</tr>
<tr>
<td>Pre-Cut Bumble Bee*</td>
<td>$6.86</td>
</tr>
<tr>
<td>White Sanded Grout</td>
<td>$.35</td>
</tr>
<tr>
<td>Night Light</td>
<td>$1.04</td>
</tr>
<tr>
<td>Night Light Clip</td>
<td>$.28</td>
</tr>
<tr>
<td>Adhesive</td>
<td>$.22</td>
</tr>
<tr>
<td>Grout Sealer</td>
<td>$.08</td>
</tr>
</tbody>
</table>

TOTAL COST PER STUDENT: $10.17*

*Greatly reduce the cost of the project by replacing the pre-cut bee with student cut designs.
Stained Glass Project Instructions:

1. Using rubbing alcohol, clean each glass piece to remove any particles or hand oils.
2. Wrap the edge of each piece of glass with 7/32” foil. Crimp the foil on the top and bottom of each piece. Burnish them smooth onto the glass with a fid or burnisher. (A)
3. Layout the pieces on a heat-resistant work surface. Homosote board works well—it is heat resistant (but not fireproof) and you can insert metal push pins into it to hold your glass in place. (Make sure metal push pins are used.) (B)
4. Apply flux on the foil, especially at the areas where pieces of glass touch using a flux brush. Tack solder the pieces together using a small amount of solder at each joint. Once the pieces are tacked together, remove the push pins. (C)
5. Apply more flux on the foil and solder the front of the pieces together. (D) On the outside foiled edges, apply flux and use a small amount of solder to “tin” the foil. (E)
6. Allow the piece to cool. Once it has cooled enough to be handled, flip your piece over, apply more flux and solder the back. HINT: If you notice any remaining foil that is still copper in color, but the piece is sliding around when you are trying to solder, you can insert a couple of push pins into your homosote board on the opposite side and slide the glass up against it, leaving the area to be tinned exposed. This way you can push against it without using your hands to keep the glass still. (F)
7. To attach the hanging ring, pre-tin the ring by applying flux and a small amount of solder. Wait for it to cool, then place it beneath the top of the soldered piece. Apply more flux and a small amount of solder to attach the ring. Allow it to cool before flipping it over. Apply more flux and solder to the back to affix the ring. (F)
8. Once you’re done soldering, wash the piece using flux remover. Once the flux residue is removed, dry the piece and polish the solder lines using polishing compound and a paper towel.
9. Attach the “shepherds hook” clip to your night light. Hang your finished piece and enjoy!

SAFETY TIP:

When working with stained glass, be sure to avidly wash your hands. Avoid touching your eyes and face when using solder and flux.

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MATERIALS COST PER PROJECT
(Based on Stained Glass Bee Night Light)

- Pre-Cut Bumble Bee* - $6.86
- Solder - $1.30
- Flux - $0.32
- Copper Foil - $0.59
- Flux Remover - $0.26
- Polishing Compound - $0.40
- Night Light w/ Shepherds Hook* - $5.86

TOTAL COST PER STUDENT: $15.59*

*Greatly reduce the cost per project by replacing the pre-cut bee with student cut designs and a standard night light with clip.

Per project cost based on 1/10 of a spool of solder and foil, 1/30 bottle of flux remover and polishing compound, and 1/300 gal of flux.

Pricing based on 2012-2013 catalog

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