Hello students, faculty, and friends of Walla Walla University! We are so glad you have taken an interest in the Personal Protection Equipment Program, and we are excited to get you plugged into service in this way. This document specifically relates to information about the creation and maintenance of cloth face masks. If you have any questions or concerns, feel free to contact PPE Ambassador Josiah Buster by emailing CHE@wallawalla.edu

Here at the Center for Humanitarian Engagement, we are committed to promoting “a campus-wide lifestyle of service by connecting the WWU campus with service-oriented tools, resources, and opportunities.” Although the members of our campus are now spread across the globe, we hope this document can help you find the resources and inspiration you need to not only protect yourself, but engage in that “lifestyle of service” by connecting with your local communities.

Many of you are likely aware that the Center for Disease Control and Intervention (CDC) now recommends “wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain.” This recommendation carries for both sick and healthy people: the CDC advises “the use of simple cloth face coverings to slow the spread of the virus and help people who may have the virus and do not know it from transmitting it to others.” Below are some other recommendations from the CDC on cloth face masks:

Cloth face masks should:
- Fit snugly but comfortably against the side of the face
- Be secured with ties or ear loops
- Include multiple layers of fabric
- Allow for breathing without restriction
- Be able to be laundered and machine dried without damage or change to shape

Studies show that homemade masks might only work 50% as well as medical-grade masks, and normally should not be used to replace them. However, with the current shortage of surgical masks, wearing a homemade cloth face mask will at least help prevent droplet transmission from infected individuals (Cambridge University Press: Testing the Efficacy of Homemade Masks: Would They Protect in an Influenza Pandemic? | Disaster Medicine and Public Health Preparedness). In addition, it is important to ensure that medical-grade masks are reserved for those on the front lines of this pandemic, such as our first responders and medical workers.

Fabric/Material Comparison
We found plenty of great DIY homemade face mask guides and tutorials. However, most did not recommend a specific type of fabric. Here is some information to help guide you through your options.

In a study to evaluate the performance of homemade masks, they compared the effectiveness of
household materials to filter out particles. The study concluded that a homemade mask should only be considered as a last resort, that a homemade mask was 3 times less effective than a surgical mask, but that a homemade DIY mask was better than nothing at all.

For reference, the coronavirus has an average particle size of 0.125 microns.

- A N95 mask can filter out 95-98% of particles 0.02 to 1 micron in size
- A surgical mask can filter out ~78% of particles 0.02 to 1 micron in size
- A linen dish towel (tea cloth) can filter out 60% of particles 0.02 to 1 micron in size
- Cotton t-shirts can filter out 50% of particles 0.02 to 1 micron in size

A tightly woven cotton or cotton mix fabric with a slight “give” or stretch was considered the best option. Cotton barrier cloth or fabric is one of the more densely woven fabrics. Compare fabrics by holding them over a light. The one that allows the least amount of light shine through should be used. Below is an infographic displaying the effectiveness of several different types of materials. If at all possible DO NOT USE: felt, fleece, or flannel.

Source: What Are The Best Materials for Making DIY Masks?
When and How to Clean your Masks:

Dr. Daniel Griffin of Columbia University, an expert on infectious diseases, in an interview with National Public Radio said the following about mask hygiene:

“Think of a mask as like underwear: It needs to be washed after each use...You don’t take this dirty mask off, put it in your purse and then stick it back on your face...It’s something that once you put on, is potentially either touching your coughs, sneezes or the spray of your speech, or protecting you from the coughs, spray, speech of other people. And now it’s dirty. It needs to basically be either discarded or washed. So if you’re wearing a cloth mask, put it into the laundry basket immediately. It’s a big no-no to pull the mask down to eat a snack, then pull it back up: You’ve just gotten whatever dirty stuff is on the mask on your hands and into your mouth”

It is important that after every use, you must throw away single-use masks and sanitize reusable masks, especially after entering heavily populated spaces such as grocery stores. Below are some comments from trusted health authorities on caring for your mask.

**Washington State Health Department:**

*Guidance on Cloth Face Coverings from the Washington State Department of Health*

Wash your cloth face covering frequently, ideally after each use, or at least daily. Masks should be washed with detergent and hot water and dried on a hot cycle. If you must re-wear your cloth face covering before washing, wash your hands immediately after putting it back on and avoid touching your face.

**Center for Disease Control and Intervention (CDC):**

*Use Cloth Face Coverings to Help Slow Spread | CDC*

Cloth face coverings should be routinely washed depending on the frequency of use. A washing machine should suffice in properly washing a face covering. When removing a face covering, individuals should be careful not to touch their eyes, nose and mouth, and wash hands immediately after removing.

**World Health Organization:**

*(COVID-19) advice for the public: When and how to use masks*

Before putting on a mask, clean hands with alcohol-based hand rub or soap and water. Cover mouth and nose with mask and make sure there are no gaps between your face and the mask. Avoid touching the mask while using it; if you do, clean your hands with alcohol-based hand rub or soap and water. Replace the mask with a new one as soon as it is damp and do not re-use single-use masks. To remove the mask: remove it from behind (do not touch the front of mask); discard immediately in a closed bin; clean hands with alcohol-based hand rub or soap and water.

**Making a Mask:**
There are many types of homemade masks out there, and we have done our best to locate and bring out the best and safest designs. Most of the mask designs in this document are from the CDC and are presented in order of easiest to most complicated. The more work you are willing to put into your mask, the more effective your mask is likely to be.

**Mask 1: Quick-cut T-Shirt Face Covering (No Sew Method): CDC**

Materials:
- Cotton t-shirt
- Scissors

Tutorial:

1. Cut 7–8 inches
2. Cut out 6–7 inches
3. Cut tie strings

Note: Due to the wealth of articles discussing the importance double layering your cloth masks, I would consider finding a way to insert a second interior layer into this design. Maybe just flip another edge of the t-shirt over and into the mask.

**Mask 2: Bandana Face Covering (no sew method): CDC**

Materials:
- Bandana (or square cotton cloth approximately 20”x20”)
- Rubber bands (or hair ties)
- Scissors (if you are cutting your own cloth)

Tutorial:
Mask 3: Sewn Cloth Face Covering (CDC)

Materials
- Two 10"x6" rectangles of cotton fabric
- Two 6" pieces of elastic (or rubber bands, string, cloth strips, or hair ties)
- Needle and thread (or bobby pin)
- Scissors
- Sewing machine

Tutorial:
1. Cut out two 10-by-6-inch rectangles of cotton fabric. Use tightly woven cotton, such as quilting fabric or cotton sheets. T-shirt fabric will work in a pinch. Stack the two rectangles; you will sew the mask as if it was a single piece of fabric.

2. Fold over the long sides ¼ inch and hem. Then fold the double layer of fabric over ½ inch along the short sides and stitch down.
3. Run a 6-inch length of 1/8-inch wide elastic through the wider hem on each side of the mask. These will be the ear loops. Use a large needle or a bobby pin to thread it through. Tie the ends tight. Don’t have elastic? Use hair ties or elastic head bands. If you only have string, you can make the ties longer and tie the mask behind your head.

![thread through knot](image1.png)

4. Gently pull on the elastic so that the knots are tucked inside the hem. Gather the sides of the mask on the elastic and adjust so the mask fits your face. Then securely stitch the elastic in place to keep it from slipping.

![tuck in knot stitch](image2.png)

Mask 4: The “Fu Face Mask” from www.freesewing.org (Recommended by Forbes Magazine in this article: https://freesewing.org/blog/facemask-frenzy/)

Go to www.freesewing.org/blog/facemask-frenzy

This site has PDFs containing sizing instructions, patterns, instructions, and video tutorials for their “Fu Face Mask.” These are extremely helpful, and the masks themselves are well-renowned and recommended.

**Wrapping Up:**

The current state of the world can easily be perceived as frightening, overwhelming, and discouraging. In times like these one verse that brings me comfort is Psalm 27:1: “The Lord is my light and my salvation—whom shall I fear? The Lord is the stronghold of my life—of whom shall I be afraid?” We don’t have to be afraid of this new situation, because the God of the universe is our salvation, stronghold, and protection. He’s got us! It is important that you daily declare the promises of the Lord over your life, to remind you of the amazing ally you have on your side.

We hope this document will serve you well in helping you find ways to create your own masks and maintain them. We also hope that you use this information to serve your local community, reaching out to provide PPE to those who can’t afford masks or don’t have the means to create them. If you have any questions or need advice getting involved in your community, remember you can contact us at CHE@wallawalla.edu. Good luck, and stay safe!