



GRAPHIC IMAGING – SUBLIMATION

SkillsUSA Championships Technical Standards



PURPOSE

To evaluate each competitor's preparation for employment and to recognize students for excellence and professionalism as a sublimation technician in the field of graphic imaging.

First, download and review the General Regulations at updates.skillsusa.org.

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with graphic communications as an occupational objective. Each state may send one high school and one college/postsecondary competitor.

CLOTHING REQUIREMENTS

Class E: Competition Specific — Business Casual

- Official SkillsUSA white polo shirt
- Black dress slacks or black dress skirt (knee-length minimum)
- Black closed-toe dress shoes

Note: Wearing socks or hose is not required. If worn, socks must be black dress socks and hose must be either black or skin-tone and seamless/nonpattern.

These regulations refer to SkillsUSA Championships Clothing Classifications that are pictured and described at skillsusastore.org. If you have questions about competition uniforms, call the SkillsUSA Store at 888-501-2183.

Note: Competitors must wear official competition clothing to the competition orientation.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
 - a. All equipment and materials used in the hands-on component of the competition.
2. Supplied by the competitor:
 - a. A graphic design enabled computer and software that can open/edit an Adobe Photoshop template that uses PNG and JPG elements. (Adobe Photoshop template will be provided to layout and create a sublimation printable design.)
 - 1). The competitor's computer and design software must be capable of creating/exporting PNG files, and then saving a copy of the PNG file to a USB thumb drive provided by the technical committee.
 - b. All competitors must create and submit online a one-page single sided resume. See "Online Submission Requirements" below for guidelines.

Note: Computers must be preloaded with the fully licensed graphic software of choice and competitors must have administrative rights to the computers to implement changes if required. No Internet access is allowed during the competition. All software should be pre-installed and tested prior to arriving at the competition to ensure the system will run offline.

Note: Internet access is not allowed during the competition. If software is not installed or operating, and competitors are required to connect to the Internet, a 25-point penalty will be assessed. If it is confirmed that the competitor/team used the Internet during the competition without the knowledge and permission of the technical committee, the technical committee can assess a penalty of 100 points.

Note: All national competitors must also check for competition-specific updates and/or competitor preparation instructions on the SkillsUSA website at updates.skillsusa.org.

PROHIBITED DEVICES

Cellphones, electronic watches and/or other electronic devices not approved by a competition's national technical committee are **NOT** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

Penalties for Prohibited Devices

If a competitor's electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the Director of the SkillsUSA Championships. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor's scores may be removed.

ONLINE SUBMISSION REQUIREMENTS

All SkillsUSA national competitors must submit their one-page single sided resume online. The deadline and link for online submissions will be published on updates.skillsusa.org.

Failure to submit any of the required document(s) listed below by the established deadline will result in a 10-point penalty.

1. One-page single sided resume

Your submission must be saved as PDF file type using the file name format of “Your Last Name_Your First Name_Resume.” For example, “Amanda Smith” would save the individual PDF submissions file as:

- Smith_Amanda_Resume

SCOPE OF THE COMPETITION

KNOWLEDGE PERFORMANCE

The competition will include a test assessing the general knowledge of graphic imaging sublimation technology processes. Competitors are required to take the SkillsUSA Professional Development Test.

SKILLS PERFORMANCE

The skills performance test will include a demonstration of individual skills in producing graphic imaging sublimation products using equipment and technologies meeting graphic imaging sublimation industry standards. Some of the procedures to be demonstrated include, but are not limited to, designing graphics to be used with the sublimation process by using the template provided in the competition. Competitors will also be asked to save those designs in a print-ready format and print the transfer to a provided sublimation-enabled printer. Competitors will also be tested on transferring sublimation graphics to several different types of substrates, such as mugs, mouse pads, metal, glass, ceramic tiles, hardboard, polyester knit cloth, slate, and fiber reinforced plastic. A quality assessment will be performed on the product of each completed graphic imaging sublimation procedure. The competitors will also be judged on their capability to complete the product in a timely manner, being aware of the need for repeatable production, salable product and safe results.

COMPETITION GUIDELINES

1. The competition will assess the competitor’s knowledge and skills of graphic imaging sublimation at various testing stations that will include:
 - a. Design a digital image and print a transfer sheet using a provided sublimation printer.
 - b. Evaluation on other transferring stations that could include:
 - 1). Transfer a graphic on a mug or other drinkware using a mug press.
 - 2). Transfer a graphic on a mug or other drinkware using a wrap and a convection oven.
 - 3). Transfer on a mouse pad or other neoprene or closed foam-based product.
 - 4). Transfer on a metal/aluminum surface. (e.g., license plate tag or frame)
 - 5). Transfer on a glass surface. (e.g., cutting board)
 - 6). Transfer on ceramic tiles. (e.g., mosaic tile)

- 7). Transfer on hard board. (e.g., cellphone stand)
 - 8). Transfer on polyester knit fabric. (e.g., T-shirt)
 - 9). Transfer on stone. (e.g., slates)
 - 10). Transfer on fiberglass reinforced plastic (FRP). (e.g., key tags)
 - c. Complete a quality control review assessment determining the level of defect for several products.
 - d. Participate in an oral professional assessment and review of the competitor's resume with an interviewer.
2. As soon as the competitors have completed an assigned job and have fulfilled all the requirements presented at the testing station, they should notify the timekeeper. The scorekeeper and judge will gather the competitors' products or worksheets for evaluation and scoring.

STANDARDS AND COMPETENCIES

GIS 1.0 — Digital Image Design and Printing

- 1.1. Review the design brief.
- 1.2. Create the design layout of the specified product(s) using provided product templates available as both a PSD file and an EPS file.

GIS 2.0 — Transfer a graphic on a ceramic drinkware product using a mug press.

- 2.1. Set up mug press for printing operation.
- 2.2. Apply sublimation transfer to the provided ceramic drinkware product.
- 2.3. Evaluate image quality.
- 2.4. Equipment cleanup and workstation housekeeping.

GIS 3.0 — Transfer a graphic on drinkware using a wrap and a convection oven.

- 3.1. Set up convection oven for printing operation.
- 3.2. Apply sublimation transfer to the provided drinkware product.
- 3.3. Evaluate image quality.
- 3.4. Equipment cleanup and workstation housekeeping.

GIS 4.0 — Transfer on a mouse pad.

- 4.1. Set up press for preprint operation.
- 4.2. Pre-press the mouse pad.
- 4.3. Transfer the print to a mouse pad.
- 4.4. Evaluate image quality related to resolution, definition and acutance.
- 4.5. Equipment cleanup and workstation housekeeping.

GIS 5.0 — Transfer on a metal surface.

- 5.1. Check that the heat press temperature.
- 5.2. Engage the heat press to transfer ink to the metal insert.
- 5.3. Evaluate image quality.
- 5.4. Equipment clean up and workstation housekeeping.

GIS 6.0 — Transfer on a glass surface (like cutting boards).

- 6.1. Transfer image on a glass surface.
- 6.2. Evaluate image quality.
- 6.3. Equipment cleanup and workstation housekeeping.

GIS 7.0 — Transfer on tiles (ceramic).

- 7.1. Set up press for preprint operation.
- 7.2. Print sublimation transfers on tiles (ceramic).
- 7.3. Evaluate image quality.
- 7.4. Equipment cleanup and workstation housekeeping.

GIS 8.0 — Transfer on hard board.

- 8.1. Set up press for preprint operation.
- 8.2. Print sublimation transfers for hardboard.
- 8.3. Evaluate image quality.
- 8.4. Equipment cleanup and workstation housekeeping.

GIS 9.0 — Transfer on polyester knit (soft goods).

- 9.1. Set up press for preprint operation.
- 9.2. Pre-press polyester knit.
- 9.3. Transfer sublimation transfers to polyester knit.
- 9.4. Evaluate image quality.
- 9.5. Equipment clean up and workstation housekeeping.

GIS 10.0 — Transfer on stone.

- 10.1. Transfer sublimation transfers on stone.
- 10.2. Evaluate image quality.
- 10.3. Equipment cleanup and workstation housekeeping.

GIS 11.0 — Transfer on fiberglass reinforced plastic.

- 11.1. Transfer sublimation transfers to fiberglass reinforced plastic (FRP) materials.
- 11.2. Evaluate image quality.
- 11.3. Equipment cleanup and workstation housekeeping.

GIS 12.0 — Transfer on pennant or car flag.

- 12.1. Transfer an image to a pennant or car flag.
- 12.2. Evaluate image quality.
- 12.3. Equipment cleanup and workstation housekeeping.

GIS 14.0 — Participate in an oral professional assessment.

- 14.1. Create and submit a one-page resume.
- 14.2. Respond positively to questions related to the five areas that follow:
 - 14.2.1. Describe personal ability to handle job assignments.
 - 14.2.2. Demonstrate ability to answer questions in technical terms.
 - 14.2.3. Explain how to handle workplace situations in a professional manner.
 - 14.2.4. Demonstrate critical thinking during the oral interview.

14.2.5. Present a realistic self-concept.

GIS 15.0 — Perform a Quality Control Assessment.

15.1. Evaluate decorated products and assess the quality of the image. Criteria include image placement, image alignment, flaws in the printed image, etc.

GIS 16.0 — SkillsUSA Framework

The SkillsUSA Framework is used to pinpoint the Essential Elements found in Personal Skills, Workplace Skills and Technical Skills Grounded in Academics. Students will be expected to display or explain how they used some of these Essential Elements. For more, visit:

www.skillsusa.org/who-we-are/skillsusa-framework/.

COMMITTEE IDENTIFIED ACADEMIC SKILLS

The technical committee has identified that the following academic skills are embedded in this competition.

Math Skills

- Read a ruler (inch system, metric system, point/pica system.)
- Use fractions to solve practical problems.
- Use percentages multiplied times formula for inks mixing.
- Simplify numerical expressions.
- Solve practical problems involving percentages.
- Solve single variable algebraic expressions.
- Calculations for image preparation. (Calculate proportional scaling solutions of two designs from artwork to garment, demonstrate ability to square and center an image during graphic imaging sublimation process.)

Science Skills

- Phase Transition: Sublimation is when a substance changes directly from solid to gas without becoming a liquid in between.
- Sublimation Temperature: Every substance has a specific temperature at which it turns from solid to gas, skipping the liquid state.
- Sublimation Inks: These inks contain dyes that turn into gas when heated, bonding with surfaces and creating vibrant prints.
- Polyester Requirement: Sublimation works best on polyester fabrics or materials coated with polyester due to their molecular structure.
- Heat and Pressure: Sublimation needs even heat to change ink to gas and even pressure to ensure good contact between transfer paper and the substrate.
- Color Reproduction: Sublimation creates detailed and vivid prints by making ink a permanent part of the substrate, not just sitting on top.
- Cooling Process: Allowing the substrate to cool solidifies the sublimated gas, ensuring the ink becomes a permanent part of the material.
- Surface Compatibility: Sublimation works only on materials that can withstand the heat and allow molecular-level bonding of ink.

- Challenges: Controlling factors like temperature and pressure is crucial and working with suitable substrates limited to those with polyester content or coatings.

Language Arts Skills

- Provide information in conversations and in group discussions.
- Provide information for oral presentations.
- Demonstrate use of nonverbal communication skills: eye contact, posture and gestures using interviewing techniques to gain information.
- Demonstrate knowledge of appropriate reference materials.

CONNECTIONS TO NATIONAL STANDARDS

State-level academic curriculum specialists identified the following connections to national academic standards.

Math Standards

- Geometry
- Measurement
- Problem solving
- Communication
- Connections
- Representation

Source: NCTM Principles and Standards for School Mathematics. For more information, visit: www.nctm.org.

Science Standards

- Understands the structure and properties of matter.
- Understands the sources and properties of energy.
- Understands forces and motion.
- Understands the nature of scientific inquiry.

Language Arts Standards

- Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world, to acquire new information, to respond to the needs and demands of society and the workplace and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.
- Students apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies and their understanding of textual features. (e.g., sound-letter correspondence, sentence structure, context and graphics.)
- Students adjust their use of spoken, written and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks and video) to gather and synthesize information and to create and communicate knowledge.
- Students use spoken, written and visual language to accomplish their own purposes. (e.g., for learning, enjoyment, persuasion and the exchange of information.)

Source: *IRA/NCTE Standards for the English Language Arts*. To view the standards, visit: www.ncte.org/standards.