An Evaluation of the Existing Operator Training System at “Company ABC”

by

Kathleen E. Diaz

A Research Paper Submitted in Partial Fulfillment of the Requirements for the Master of Science Degree in Training and Development

Approved: 4 Semester Credits

Dr. David A. Johnson
Research Advisor

The Graduate School
University of Wisconsin-Stout

December, 2007
ABSTRACT

This study will discuss the installation and implementation of a new production line and the corresponding training methods at Company ABC. Additionally, this paper will evaluate the effectiveness of Company ABC’s current training program.

This study will also examine various training methods used in today’s business and industry. The literature review will then consider adult learning styles and the consequences of not addressing these styles when designing, developing, and implementing training. This section will conclude with Donald L. Kirkpatrick’s Level Two evaluation of training – “Learning”.

Methodology developed, validated and utilized to collect the data for this study will be identified. In addition, the effect the limitations had on the data analysis will be explored.
Each lesson will be analyzed to determine student improvement from the pretest to the posttest. Figures will be used to illustrate some examples of significant change. Lastly, conclusions and recommendations will be identified for Company ABC to assist them in understanding and applying the data.
I would like to take this opportunity to thank, first and foremost, my husband and my son, for all their support and understanding throughout my entire masters program. In addition, I would like to thank Carl Jalowitz and Greg Wold, two production supervisors at "Company ABC" who were vital parts in the writing and validating of the pre and posttests.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>i</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vi</td>
</tr>
<tr>
<td>Chapter I: Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>2</td>
</tr>
<tr>
<td>Research Objectives</td>
<td>2</td>
</tr>
<tr>
<td>Limitations of the Study</td>
<td>3</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>3</td>
</tr>
<tr>
<td>Chapter II: Literature Review</td>
<td>5</td>
</tr>
<tr>
<td>Chapter III: Methodology</td>
<td>16</td>
</tr>
<tr>
<td>Introduction</td>
<td>16</td>
</tr>
<tr>
<td>Subject Selection and Description</td>
<td>16</td>
</tr>
<tr>
<td>Data Collection Procedures</td>
<td>16</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>17</td>
</tr>
<tr>
<td>Chapter IV: Results</td>
<td>18</td>
</tr>
<tr>
<td>Introduction</td>
<td>18</td>
</tr>
<tr>
<td>Lesson 1</td>
<td>19</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>19</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>19</td>
</tr>
<tr>
<td>Lesson 4</td>
<td>20</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>20</td>
</tr>
</tbody>
</table>
Lesson 6 ................................................................. 21
Lesson 7 ................................................................. 21
Lesson 8 ................................................................. 21
Lesson 9 ................................................................. 22
Lesson 10 ............................................................... 22
Lesson 11 ............................................................... 23
Lesson 12 ............................................................... 24
Chapter V: Discussion ........................................... 25
Conclusions .......................................................... 25
Recommendations .................................................. 25
References ............................................................ 27
Appendix A: Lessons with Objectives and Questions .......... 29
Appendix B: Consent Form ........................................ 42
Appendix C: Pre/Post Test ......................................... 44
Appendix D: Filler Task Listing ................................. 52
Appendix E: Pre/Post Question Analysis ........................ 54
List of Figures

Figure 1: The Instructional Relationship ................................................................. 9
Figure 2: Delivery Systems for Information Richness ............................................. 10
Figure 3: Pretest and Posttest Analysis ................................................................. 18
Figure 4: Lesson Eight Question Analysis ............................................................ 22
Figure 5: Lesson Eleven Question Analysis ......................................................... 24
Chapter I: Introduction

Company ABC, located in Menomonie Wisconsin, produces a variety of food products including hot cocoa and pudding. This study will concentrate on the training system in the pudding department, also known as Hassia. Hassia is a German name for the machinery used in both pudding lines, which are referred as H-1 and H-2. The Hassia machinery was installed in 1995 and produces approximately 85% of all the pudding produced in Menomonie and is a Thermo-form/Fill/Seal machine with Aseptic capability. In June 2006, H-1 and H-2 became the only pudding production lines when the Wet Department, which produced pudding sticks, closed.

Company ABC’s corporate office, located in Omaha Nebraska, announced a restructuring plan that closed several plants, including the Rossford Ohio plant, that also produces pudding. With this restructuring plan, one of the Rossford lines (H-3) will be relocated to the Menomonie facility. The new H-3 line is set for production to begin on September 1, 2007; however employees will be transferred into the department and/or brought on board and begin their training by June 1, 2007.

Statement of the Problem:

This study examines the effectiveness of the current training methodology used for the existing Filler training. Many new employees will complete the current method of on-the-job training involving instruction by multiple trainers. With the current on-the-job training occurring while heavy production is in progress, it is a concern that crucial portions of the Filler duties not be overlooked as production demands escalate.

Because new employees will be instructed by multiple trainers during the training process, some concerns are raised including missed material, personality conflicts, and the
trainers' capability and knowledge. This training approach also raises questions as to whether or not new employees are being trained to their highest capability or if the trainees are receiving the knowledge necessary to ensure they are capable of running the Filler on their own.

Even though the H-3 line will be new to the Menomonie facility, it will be run on virtually the same machinery that is currently used for training the H-1 and H-2 pudding production lines. Given that fact, the filler training on H-3 will parallel the training presently provided to workers on the other lines. Though the filler training will not need to be altered, there is a need to evaluate the current training delivery method to determine the effectiveness of such methods.

Purpose of the Study

The purpose of this study will be to evaluate the current filler training by facilitating pre- and posttests. Upon completion of the pre- and posttests, recommendations will be made on ways to improve and update the training to ensure that it is applicable to the majority of personnel brought on board.

Posttests will be administered to the H-1 and H-2 employees that will transfer to the H-3 line. The pretests and posttests, will be administered to any "new" employee. For the purpose of this field study, "new" refers to any current internal employee transferring into the H-3 department from other departments and any new employee hired externally.

Research Objective

The research objective of this study was to examine and document the effectiveness of the current training method to determine whether or not change is needed.
Limitations of the Study

The primary limitation of this study was the small group size of both groups: existing and "new" employees. Based on the small number of employees who currently perform the Filler function, the number of employees analyzed in this study did not provide an accurate representation of the training method used. In addition to the small population, the employees leaving the company or transferring into a new job within the company made it difficult analyze the final data and to provide useful information regarding their training program back to Company ABC.

A second limitation was the limited technical knowledge of the researcher which hindered the original draft of the questions and prolonged the validation process. Once the researcher had composed the original 96 questions and they were all validated, the questions had to be narrowed down to 48 total questions. With the researchers limited technical knowledge, there may have been questions omitted that were more useful than ones left in. It is also felt that given the technical nature of the Filler Operator position, that having more questions would have provided a clearly understanding of the learning that occurred during training.

The third limitation occurred at the completion at pretests and the posttest, with the final number of both tests not matching. This limited the researcher's ability to analyze the data as originally planned.

Definition of Terms:

Aseptic. To be aseptic means the machines have been "challenged" by various test methods to determine that harmful organisms do not exist within the machine nor can they enter. That "challenge" test has to be filed with the FDA (Better Process School Training Manual, 1976).
To be Aseptic all three phases of the process: materials, machine and the process, must be "commercially sterile". Materials are made with various layers to prevent entry into the cups and then steam sterilized before they enter the fill chamber. The Aseptic phase of the "machine" includes all of the filler and the interior areas of the tunnel. Finally, the "process" portion of the Aseptic process is the portion that cooks and cools the product (The Food Processors Institute, 1988).

**Hassia.** German origin name for the portion of the production line that produces the cups, fills the cups and does all the packaging (Hassia Department Intranet Site, July 2007).

**H-1.** Hassia – 1, line number one of pudding and gel production line.

**H-2.** Hassia – 2, line number two of pudding production.

**H-3.** Hassia – 3, line number three of pudding production.

**Filler.** Is the part of the Hassia that fills the cups with finished product.

**Thermo-form.** Is a machine that is capable of taking base materials and forming it into a secondary container, fills that container, seals that container, and then trims it out for further packaging (The Food Processors Institute, 1988).
Chapter II: Review of Related Literature

Introduction

Within the high tech world of manufacturing, it would seem to an outsider that everything would be in place to ensure that companies have everything that they need to succeed. However, the one area where companies seem to be lacking is employee training. This is not to say that there is no training in place; however, it seems that management is too busy chasing the bottom-line to focus on the needs of their employees. When training is provided, it is often rushed and employees are pressured to fill their own gaps.

Chapter II will explore the three primary training methods used today in business and industry, in addition to addressing the different types of adult learning styles and their characteristics. Donald L. Kirkpatricks’ Level 2 training evaluation – “Learning” will also be reviewed.

Training Delivery Methods: On-The-Job

Training programs are vital to a company’s success and are especially important in the early development of new employees. One-on-one on the job training ensures that new employees receive the knowledge and skills necessary to be successful. This is key when introducing new programs or technologies to existing employees (Kelley-Tunis, 2006).

Due to a growing demand for highly trained technicians, on-the-job training has taken on a different makeup than the typical type of on-the-job training. Apprentice programs are becoming a way for companies to keep up with a growing demand for more well qualified employees. Seen, by William Macchione, state director of the Empire State Carpenters
Apprenticeship Program, apprenticeships are the ultimate extension of on-the-job training, letting the participants earn while they learn and ultimately not costing them anything (Solnik, 2007).

Citing a growing demand for well-trained technicians, the Northeast Equipment Dealers Association (NEDA) developed an apprenticeship program. This apprenticeship program provides on-the-job training for specializing apprentices. By working together with colleges and universities, relationships are able to be facilitated between students and the employer, enabling the student to efficiently transition into a career path while also providing the employer with an effective way to hire and train a new employee. The key to a successful apprenticeship program is finding a business that has the willingness and financial capacity to sponsor/hire a student. Though beginning apprentices may not be effective when starting out, the expectations are that their skill set and knowledge will progress (Wartgow, 2007).

The director of the Northeast Equipment Dealers Association (NEDA), Tim Wentz, states that on-the-job training is the backbone of the program and that he hopes that the apprentices will find it easier to focus on their studies, knowing that their studying won’t be in vain, and finding that the flexibility of the program, while being paid, will meet both employer’s and student’s needs (Wartgow, 2007).

The apprenticeship program for the Northeast Equipment Dealers Association is set up to include 4,000-plus hours of on-the-job and roughly 590 hours of correspondence study to incorporate skill sets and information that are necessary for an apprentice to become a successful technician. To get an apprenticeship program off the ground and help ensure its success Wartgow (2007) recommends following the eleven step NEDA blueprint.
Training Delivery Methods: Classroom & Multimedia

In today's modern world, it is being discovered that the typical old school version of classroom training is not as effective as was once thought (Perry, 2003). Companies are moving towards more of a mixture of technology-based training versus classroom instruction for many reasons; however, one of the most prevalent reasons is cost. Studies have shown that technology-based training costs can be 25 percent to 75 percent lower than classroom instruction. With many companies in today's society feeling the pressure to employ technology based training solutions instead of continuing their reliance on traditional classroom training, two types are becoming the current front-runners: CD-ROM and Web-based training (Perry, 2003). 

When comparing multi-media training to classroom instruction, one could break the differences into three different categories: Cost, Instruction, and Administration.

Cost

Cost refers to the impact of training on the bottom line or the cost of doing the training. One of the biggest reasons why companies adopt multimedia training is the cost savings it brings. The cost savings can be found in fewer dollars spent on instructors, renting facilities and any travel expenses incurred (Perry, 2003).

Instruction

Instruction refers to how the course material is delivered. Instruction in a classroom setting requires that students spend many hours listening to one-way communication with the course content varying based on the instructors skill level. Instruction for self-paced media includes instruction that engages the students at the same time they encounter new content. It also allows the students to learn at their own pace. However, there are two areas where classroom instruction is considered superior to multimedia delivery: teaching higher order
cognitive skills and the application of past learner experiences in the learning process (Perry, 2003).

Administration

Administration refers to tasks related to managing the instruction such as scheduling and location of the training and is where flexibility is a key concern. With typical classroom instruction, the administrator must wait until there are enough students to ensure that the training is cost effective. With multimedia training, the more students that take the training the more cost effective the training becomes; however, they can take the training from across the hall or across the country. Multimedia training allows students to make use of courseware whenever it is needed, promoting the benefits of just-in-time learning (Perry, 2003).

Overall, the benefits of using multimedia training versus classroom training can be broken down into five categories (Perry, 2003):

1. Less time needed to train
2. Higher student achievement/job proficiency
3. Higher content retention
4. More consistency in delivery of content
5. More student/course satisfaction and motivation

Despite the continued rise in the use of multimedia, the 2007 State of the Industry Report still shows that classroom training remains the leading form with 54 percent of training consisting of instructional delivery among leading-edge firms and nearly 40 percent of training consisting of a technology base (ASTD, 2007). Instructor-led training is likely to remain the dominant form of instruction for most types of training, due in part to the unique qualities a trainer brings to the instructional relationship. Instructor-led training is a highly specialized form
of communication where the student and teacher assume their specific roles. Figure 1 depicts the instructional relationship and how information is mutually transferred between the participant and the instructor in a classroom training setting (Farrell, 2000).

**Participant**

- Assumes responsibility for learning
- Provides instructor with feedback
- Provides personal experience

**Instructor**

- Transfers content
- Transfers feedback
- Varies in information richness
- Provides instruction
- Varies in information richness
- Monitors progress
- Adjusts instruction

**Delivery System**

*Figure 1 (Farrell, 2000). The Instructional Relationship*

Training is a specialized form of communication and uses many of the same technologies found in multimedia systems. Effective training delivery systems will impact the information richness and the information processing demands.

Information richness is the nonverbal cues, such as posture and the facial expressions of the trainer that can be as important as words or numbers. Figure 2 reveals that information richness diminishes when there is less interaction between the participant and the instructor through distance learning. In addition, personalized instruction, such as having the participants share personal experiences related to the topic, are also a part of information richness (Farrell, 2000).
<table>
<thead>
<tr>
<th>Delivery System</th>
<th>Capacity for Information Richness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face instruction</td>
<td>High</td>
</tr>
<tr>
<td>Distance learning</td>
<td></td>
</tr>
<tr>
<td>Stand-alone PC</td>
<td>Low</td>
</tr>
<tr>
<td>Video</td>
<td></td>
</tr>
<tr>
<td>Print</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 2 (Farrell, 2000). Delivery Systems for Information Richness*

Information processing demands depend on the material covered in the training. When the information processing demands are high, managers prefer face-to-face communication. Farrell (2000) has shown that learning situations vary in the demands placed on the learner as well based on the type of knowledge and skills they are expected to obtain. It is reasonable to conclude that the type of communication system used by trainers should vary depending on the unique information processing demands required to attain instructional objectives.

Twentyman (2007) found that, 71 percent of employees agreed that on-the-job training delivers the skills they need for their career, and 62 percent stated that they have benefited most of all from a mixture of formal and on-the-job training.

*Adult Learning Styles*

Malcolm Knowles pioneered the thinking about adult learning, emphasizing that adult learning is self-directed and that the adults expect to take responsibility for their own decisions (Cotton, 2004; Leith, 1997). There are four main points to Knowles' adult learning theory: 1. adults need to know why they need to learn something, 2. adults need to learn experientially, 3. adults approach learning as problem solving and 4. adults learn best when they see the topic has
immediate value to them (Cotton, 2004; Leith, 1997). Learning for adults must also be tied to an important business need (Bartholomew, 2006).

Adults develop a preferred and consistent approach to learning, and no person has only one particular learning style. There are various ways in which individuals process and retain new and difficult information, and adults tend to have a preference for one or two over the others (Cotton, 2004; Reynolds, 2002; Greg & Cote-Bonanno, 2003). There are three primary learning styles according to the Neuro Linguistic Programming (NLP) model: visual, auditory or kinaesthetic learners (Reynolds, 2002; Cotton, 2004; & Seip, 2006). Men typically are visual learners and think primarily in pictures or other visual stimuli, such as diagrams. Women typically are auditory learners and process primarily through remembered and imagined sounds. They prefer information that is spoken and heard. Kinaesthetic learners process information primarily through their feelings (physical and emotional), where material can be touched or where the trainee can be physically involved with the to-be-learned information (Kratzig & Arbuthnott, 2006; Cotton, 2004; Reynolds, 2002; & Seip, 2006).

Understanding different learning styles is one thing, integrating them within a training session is another. It can be overwhelming trying to incorporate all of the necessary information into a training session along with the different intelligences and learning styles. This is why a trainer must understand the audience and know their learning styles as well. In addition, each learner needs to have an experience, something that they can relate the training back to (Reynolds, 2002; Moran, Kornhaber & Gardner 2006). Trainees need to have the experience, then they need to reflect on the experience, relate it to some model or theory and plan what to do next (Reynolds, 2002).
Trainers must take into consideration the theory of Multiple Intelligences as well. Multiple intelligences is a concept that came from the work of Howard Gardner. It is a concept that states that people can be intelligent in different ways and that we all have a mixture of intelligences but with different strengths and weaknesses. Howard Gardner’s concept consists of the intelligence in the capacity to solve problems or fashion products that are valued in one or more cultural settings (Gardner, 2006; Cotton, 2004; Reynolds, 2002; Moran, Kornhaber & Gardner 2006). Reinold (2002) provides a very detailed graph breaking down the multiple intelligences, showing appropriate training methods that can be developed and used for each intelligence. The eight different intelligences, are as follows:

(1) Verbal linguistic – great with words  
(2) logical mathematical – logical and analytical  
(3) visual/spatial – pictures, diagrams  
(4) bodily kinaesthetic – dancers  
(5) musical – Mozart  
(6) naturalist – understanding of ecology  
(7) interpersonal – good at relating with other people  
(8) intrapersonal – good at understanding yourself

No one is suggesting that a separate training be designed for each learning style and intelligence; however, to promote learning across each style and intelligence, trainers need to offer rich experiences that reflect as many as possible in each training lesson (Cotton, 2004; Reynolds, 2002; & Moran, Kornhaber & Gardner 2006).

It is necessary to help meet the learning needs of the adults attending the training and help ensure that they remain engaged in learning. There are four barriers that adults put up to
participating in training sessions: 1. situational, 2. institutional, 3. epistemological and 4. dispositional barriers. Situational barriers include poor learning environment, lack of time, and training location. Institutional barriers include costs, course scheduling and course availability. Dispositional barriers include a lack of a clear goal and epistemological barriers are concerned with the diversity of academic disciplines and communication techniques (Umble & Dooley, 2004).

One way to avoid these barriers is to ensure that there are clear expectations and a disciplined process in place. Employees need to know that there will be follow-up and they will be evaluated and to understand that the learning is tied to an important business need that directly affects them (Bartholomew, 2006).

Cotton (2004) notes that Knowles’ theory of andragogy assumes that the adult learner has voluntarily enrolled in the training. In most cases of corporate training, the employees are told that they must go, that is it mandatory for them. This can be one of the biggest, if not the biggest, hinders to learning. Being made to attend training that you don’t feel is necessary and/or don’t want to attend, is no different then being forced to take a course for a degree program that you feel is not necessary; it tends to close the trainee’s mind to the training all together. Knowles (1989) would come out and say that he knew that the training was a requirement and that some did not want to be there. By doing so, their resistance is quickly diminished and Knowles hypothesized that by making it public that he knew some trainees were there under compulsion and that he wished it wasn’t so, the resister’s wind was taken out of their sails and made it legitimate for them to start getting involved.

Adults also come to training with years of conditioning that prompts them to perceive the role of “student” as a dependent one. This in turns puts the pressure on the trainers to treat them
as children because that is the trainees’ preconception of education (Knowles, 1989). In addition to these adult learning barriers, they also have to deal with psychological conflict. According to Knowles (1989), the typical response to having a psychological conflict with something, whether it is learning or something else, is to flee from it. In education, Knowles refers to this as “resistance to learning”, “poor motivation”, or “dropping out”. Hence, the importance of providing adult learners with some kind of orientation experience and responsibility for the process of learning. If trainers fail to engage trainees in taking some responsibility, it is Knowles (1989) assumption is that the fault becomes that of the trainers’ rather than the trainees.

*Training Evaluation Method: Kirkpatrick’s Level 2: “Learning”*

Donald L. Kirkpatrick’s four levels of evaluation began in 1959 (Kirkpatrick, D.L., 1996) with a simple and practical approach to evaluating training during the writing of his dissertation. The chief purpose was, and still is, to clarify the meaning of evaluation and offer guidelines on how to get started and to proceed with evaluating your training program. However, the guidelines were never intended to describe exactly what to do and how to do it. Kirkpatrick’s dissertation developed four levels of evaluation: Reaction, Learning, Behavior, and Results. Level One (Reaction) measured participants satisfaction with the training process; Level Two (Learning) measured participants improvement in knowledge, skills and ability; Level Three (Behavior) measure participants application of the things learned in training back on the job; and Level Four (Results) measured the improvement in organizational effectiveness because the training occurred (Kirkpatrick, D.L., 1996).

Each level offers a valid reason as to why one would want to take the time to evaluate a training program and Kirkpatrick consistently provided the same reasons in all of his writings. These reasons consisted of: to decide whether to continue offering a particular training program,
to improve future programs and to validate your existence and job as a training professional (Kirkpatrick, D.L., 1996).

Level 2 Evaluation – “Learning” evaluates the learning that took place during the training and measures the knowledge acquired, skills improved, or attitudes changed due to the training. It is important to objectively determine the amount of learning that takes place (Kirkpatrick, D.L., 1996).

There are measurement guidelines for each of the four evaluation levels; however, this study will consider Level 2. For Level 2 Evaluation – “Learning” the guidelines are as follows: 1. use a control group if feasible, 2. evaluate knowledge, skills or attitudes before and after the training; such as a pre and posttest, 3. attain a response rate of 100 percent and finally 4. take appropriate action (Kirkpatrick, D.L., 1996).

An evaluation of learning can be built into the training by setting up before-and-after situations in which trainees demonstrate whether they know the principles or techniques being taught. In addition, evaluation of learning can be served through classroom activities, possibly comparing the before-and-after scores and response, such as on a pre and posttests (Kirkpatrick, D.L., 1996).
Chapter III: Methodology

Introduction

The objective of this study was to review the existing training system in the Hassia Department at Company ABC. The study examined the Filler portion of the existing training system to determine if the methodology currently being utilized is effective. Throughout Chapter III, the methodology used, the data analysis and the limitations will be discussed.

Subject Selection and Description

For this study, the population utilized was any “new employee” hired/assigned to run the Hassia-3 pudding production line. New employees refer to any employee who transferred into the Hassia-3 Department from either the Dry Packaging Department or the Processing Department. It also refers to anyone who was hired from outside Company ABC. The reason for selecting this population to conduct the study was the opportunity to simultaneously test a relatively large number of new employees.

Data Collection Procedures

To begin the data collection process, the researcher was provided a copy of all the 12 lessons for Filler training developed by a production supervisor at Company ABC in charge of organizing the training for the Hassia department. Each lesson consisted of performance objectives, learning resources, a body of test and learning activities that included essay type test questions. The performance objectives for each of the lessons were rewritten in a standard format to meet the specifications of each lesson by the researcher. In addition, the researcher developed 96 multiple choice questions for a pretest and a posttest. Upon completion of the newly formatted performance objectives and the 96 multiple choice questions, the objectives and
questions were validated by the production supervisor and two current Filler Technicians. A 48 question multiple-choice format pre and posttest pertaining to the "filler" duties was then developed and finalized from those original 96 questions. Upon the hiring of the new Machine Operators for the H-3 Department and the current Company ABC employees, who were "new" to the position, the pretest was administered. In addition to the pretest being administered to the new employees, the posttest was administered to the Company ABC employees who were in the Filler position on the H-1 and H-2 lines. After the eight week training period was completed, posttests were administered to the "new" employees to the H-3 Department.

Data Analysis

Upon hire and/or transfer into the H-3 Department, each Machine Operator was asked to participate in this study, but was also given the opportunity to not participate. All employees who were eligible to participate in the study participated and no one declined. Upon completion of all of the pre and posttests, the intention was to analyze the data using hypothesis tests on paired differences between two data sets.

Specifically, the data were to be analyzed using the T-test: Paired two-Sample for Means and based on the analysis, recommendations were to be made. However, due to employee turnover, after the completion of the training period there were not as many employees to take the posttest as took the pretest, thus making the use of Paired T-Tests invalid. Therefore the analysis focused only on posttest scores.
Chapter IV: Results

Introduction

The objective of this study was to review the existing training system in the Hassia Department at Company ABC. The study examined the Filler portion of the existing training system to determine if the methodology currently being utilized is effective. The Filler training consisted of 12 lessons covering various topics with questions and learning activities at the end of each lesson. Each lesson included a breakdown of the learning resources available to the trainees necessary to complete each lesson (see Figure 3).

Figure 3. Hassia Filler Training Lessons
Lesson One: General Introduction

The objectives of Lesson One covered food safety requirements, the different work areas and the related equipment located in those work areas, and familiarity with the procedure and reference manuals.

Participants scored 21% on the pretest and 30% on the posttest with the only improvement occurring on question one, with questions two and four remaining the same. Overall Lesson One displayed a 9% improvement, with the training information and questions pertaining to “general information” such as knowing where manuals are located and what information is discussed in certain manuals, in addition to basic quality information.

Lesson Two: General Safety

Objectives for Lesson Two covered Company ABC’s Safety Statements and other safety information such as: safe practices, confined spaces, emergency stops, how to lockout/tagout equipment and forklift operation and certification.

Between the pretest and the posttest participants, there was only a three percent improvement, with all the improvement coming again on only one question. The pretest participants overall score on lesson two was a 63%, with the posttest overall score of 66%. The issues on both the pre and posttest were on questions five and six. Both questions pertained to the general safety principles of the company which were taught to trainees during their training period, and throughout the monthly mandatory safety trainings conducted by the safety manager.

Lesson Three: MP2 Computer Systems

Lesson three covers the computer system used throughout the facility to request work and for checking out parts. The objective of this lesson was to learn the functionality of the system and how to create a work order and a work request.
The outcome of the pre and posttests for lesson three are reminiscent of lesson two where there was only a three percent improvement, with a pretest overall score of 47% and the overall posttest score of 50%. Once again the only improvement came on one of the four questions and on the most basic of all the questions, question number seven, pertaining to work requests.

*Lesson Four: Machine Controls*

Objectives for lesson four dealt specifically with the filler part of the Hassia machine. At the end of the training, trainees would be familiar with the pages of the Operator Control Screen, able to locate and adjust values for standard operations, understand and interpret symbolism of the Operator Control Screen and be familiar with the Hassia start and fault conditions.

Lesson Four is the first lesson where there was an 11% increase between the pretest, where the overall average was 42%, and the posttest, where the overall average was 53%.

*Lesson Five: Ovens, Form and Thermoforming*

The Lesson five objectives included trainees being able to identify and understand the function of the contact heaters, the forming station and the related controls for both. In addition, the trainees also learned the basics of thermoforming where body stock is heated and formed into cups.

Between the pre and posttests there was a 17% improvement with the overall average score of the pretest was 63% and 80% for the posttest. With the information in the lesson and the lessons to come pertaining to pudding machine specific information, it was quite impressive that the participants scored well on the pretest. Some of this pretest knowledge could be attributed to the pretest participants not being new to the company, just new to the department.
Lesson Six: Sterilization Stations

The only objective for lesson six was to identify and understand both the cup and lid sterilization stations. However, in order for the trainees to understand both the sterilization stations, they also needed to learn all the component parts and how they worked.

The pretest score was relatively low at 23%; however, the overall posttest score was 38%. On the other hand, an overall score of 38% is still relatively low; particularly on one of the most important lessons.

Lesson Seven: Fillers

Objectives for lesson seven were to understand how the Fillers work, to learn the controls for the Fillers and to become familiar with and to be able to identify the components of the Fillers. Lesson seven had a 17% improvement with the participants of the pretest having an overall average score of 41% and a 58% overall average score on the posttest.

Lesson Eight: Edge Sealer and Seal Station

Lesson eight had several different objectives. After the training, trainees would be able to locate and identify the parts of the edge sealer (pre-sealing device), explain the function of both the edge sealer and the sealing station, locate the controls for the edge sealer and the sealing station and locate and identify the component parts of the sealing station.

Even though lesson eight is company and machine specific, the pretest scores were among the highest, with the overall average for the pretest of 66% and the overall average of the posttest of 65%. Lesson eight is the only lesson where there was a decrease in the overall average between the pre and posttests; however this should not negate the scores (see Figure 4). It is difficult to say with any certainty why the scores declined on the posttest.
Lesson Nine: Web Advance and Punch Station

Lesson nine’s objectives stated that the trainees would be able to locate the web advance beam and its components, explain the function of the web advance, locate the punch station, explain the function and the process of the punch, identify the components of the punch stations and to be able to locate the controls for the punch station and the web advance.

There was an improvement in test scores between the overall average between the pretest, where the overall average was 50%, and the posttest where the overall average was 68%. The improvement for lesson nine was spread between three of the four questions, with no improvement between the pre and posttests, coming on question number 36, which dealt with the direction in which the punch moves when positioning itself for the cut.

Lesson Ten: Scissors and Walking Beam

The objectives for lesson ten were that once the training was completed, the trainees would be able to locate the scissor station and the component parts of the scissor station and
explain its function. In addition, trainees would be able to locate the walking beam, identify the component parts of the walking beam and explain the function of the walking beam.

The overall average difference between the pre and posttests for lesson ten was the third highest increase. For the pretest the overall average was 53% and the overall average score for the posttest jumped to 83%. There was marked improvement between the pre and posttests on three of the four questions.

Lesson Eleven: System Sterilization

Lesson eleven’s objectives were that after the training, the trainees would be able to demonstrate an understanding of sterilization, know how to prepare the machine for sterilization, be able to sterilize the C-1 and C-2 filters and sterilize the C-3 tunnel. In addition, the trainees would be able to verify successful sterilization and complete the sterilization checklist.

The improvement for the overall average between the pre and the posttests was the highest increase of all the lessons, with an increase of 60%. Participants taking the pretest had an overall average score of 17%, while the participants taking the posttest scored an overall average of 77% (see Figure 5).
Lesson Twelve: Clean in Place

After completing lesson twelve, the participants would demonstrate the following objectives: an understanding of the Hassia and its cycles, times and chemical concentrations; an understanding of the Clean In Place process including knowing when and why a clean in place needs to be performed; demonstrate the correct procedures for performing a complete clean in place; and demonstrate an understanding of the different clean in place’s and their respective flow paths.
Chapter V: Discussion

Conclusions

There appears to be a lack of structure to the training program at Company ABC. Also, supervision and management are not involved in training new employees. All training is facilitated by production line employees who have been given training responsibilities but not provided guidelines on training methods. There is a task list, (see Appendix D), that trainers are instructed to follow; however, it is all left up to the trainer’s discretion on how to cover the items on the task list.

Recommendations

The following six recommendations, if followed would improve Company ABC’s existing training program. 1. Establish a solid foundation to the existing training program. The bare basics of a training program are already established; however, there is no accountability to the information that is transferred from the trainer to the trainee. Part of this foundation should require that the trainee be allocated time to spend reading their online lessons and answering the questions at the end of each lesson, requiring a minimum score of them. The trainees should also be allocated time to spend referencing vendor and product manuals to assist them in full-filling the lessons and broaden their knowledge base when they are participating in their on-the-job training.

2. Trainer and trainee accountability. Hold trainees accountable for completing the online lessons and answering the questions. Hold the trainers, as well as the production supervisor in charge of organizing the training, accountable for ensuring that the trainees complete the requirement training activities.
3. Standardized lesson plans. This training program needs to include an outline of what needs to be covered, the method in which the particular information is to be covered (on-line, on-the-job, via manuals, etc.) and check offs and sign offs for accountability purposes.

4. Improve training methods. To assist Company ABC in meeting the training needs of their employees and address the different adult learning styles, I recommend they integrate some of the following training methods into their training program: a. On-the-Job Training/On-the-Job Mentoring, b. Classroom Training, c. Module Training (Self-paced), and d. Specialized Training.

   Within the On-the-Job Training/On-the-Job Mentoring component, the following methods could be utilized: job instruction training, coaching and mentoring. The Classroom Training component should consist of lecture, time for discussion with trainers and trainees and audiovisual applications. Audiovisual applications could consist of PowerPoint Presentations, videos/DVD’s, etc. The Module Training should consist of computer-based interaction, DVD, manuals/booklets/self-testing and internet.

5. Hire a training intern. Given the fast paced environment of and the current workload of all employees of Company ABC, I would recommend that Company ABC hire, at a minimum, a training intern to develop a training program.

6. Hire outside training consultants. For the Specialized Training component, Company ABC should hire outside consultants to facilitate specific training, bring in corporate trainers, hold on-site workshops and professional development type conferences and trainings and assist the employees in paying for outside specialized training and college courses.
References


Hassia Department Intranet Site. (July 2007).


Twentymann, J. (March 2007). Better out or in? Director, 60(8), 35.


Wartgow, G. (February 2007). EARN While They LEARN. Yard & Garden, 30(4), 14-16.
Appendix A

Lesson 1 Objectives:

Upon completion of Lesson 1 training, each new employee will be able to describe the Swiss Miss Quality Objective.

Upon a complete tour of the department, each new employee will be able to identify the different work areas, the equipment and the corresponding reference manuals.

1. Our quality objective is:
   a. To produce shippable products
   b. "Right the First Time" with "Zero Defects"
   c. Job security comes from a quality product
   d. "Treat customer's product as if they were your own"

2. Which of the following is NOT a room within the department?
   a. Silo Room
   b. Filler Room
   c. Hassia Testing Area
   d. Chemical Storage Area

3. There are many reference manuals available, which manual references what to do to prevent foreign material?
   a. Safety Information Boards
   b. PQM – Product Quality Monitoring
   c. GMP – General Manufacturing Procedures
   d. HACCP – Hazard Analysis & Critical Control Points
Lesson 2 Objectives:

Upon completion of Lesson 2 training, each new employee will be able to identify & explain the following information:

- Swiss Miss safety principles
- Safety vision
- Safe practices
- Confined spaces & procedures of entry
- E-stop locations
- Lockout/Tagout points
- MSDS points
- Procedures for the Filler equipment lockout/tagout
- Location of safety equipment & escape routes

Upon completion of Lesson 2 training, each new employee will be able to demonstrate proper lifting techniques.

Upon completion of Lesson 2 training, each new employee will become certified to drive forklift.

1. Which of the following is a safety principle?
   a. Accidents happen
   b. Accidents are avoidable
   c. Safety is your responsibility
   d. Safety is not something to be concerned about

2. Safe Practices define:
   a. The Key Concepts of Safety
   b. The Swiss Miss Safety Vision
   c. Acceptable Behavior while at work
   d. The Swiss Miss Mission Statement

3. Lockout/tagout means to:
   a. Shutdown a machine
   b. Clock out at break time
   c. Disconnect equipment from energy source
   d. Stopping a machine to perform maintenance

4. Which of the following does NOT describe a confined space:
   a. Requires a permit for entry
   b. Is designed for continuous occupancy
   c. There are limited means for entry/exit
   d. Configured so an employee can bodily enter
5. The following are E-stop locations on the H1 & H2 Fillers, except:
   a. At web roll area
   b. On control panel
   c. At discharge end
   d. The web sterilizer
Lesson 3 Objectives:

Upon completion of Lesson 3 training, each new employee will be able to describe the differences between a work order, a work request and the MP2 system.

Upon completion of Lesson 3 training, each new employee will be able to enter a work order and a work request using the MP2 system.

1. What is a work request?
   a. Order of needed supplies
   b. The schedule I want to work
   c. Description of a repair for maintenance
   d. Used in maintaining an accurate inventory

2. What is a work order?
   a. Assigns work
   b. Checks inventory
   c. Parts check out & assigns work
   d. Assigns employee to work station

3. Which of the following is the MP2 program NOT intended to do?
   a. Ordering
   b. Track repairs
   c. Maintain inventory
   d. Schedule Preventive maintenance

4. If you replaced a pump gasket, how would you document it?
   a. On a work order
   b. On a work request
   c. In the MP2 program
   d. E-mail the maintenance lead
Lesson 4 Objectives:

Upon completion of Lesson 4 training, each new employee will be able to explain the flow display symbols on the Operator Control Screen.

Upon completion of Lesson 4 training, each new employee will be able to identify the Hassia start and fault conditions.

Upon completion of Lesson 4 training, each new employee will be able to locate and make necessary adjustments to the values for standard operations.

1. There are how many auxiliary control panels on the Hassia?
   a. 5
   b. 6
   c. 7
   d. 8

2. Which of the following control page’s function is to activate/deactivate the station?
   a. Channel
   b. Counter
   c. Control monitor
   d. Parameter monitor

3. Which of the following is NOT servo-controlled?
   a. Filler
   b. Plug assists
   c. Web advance
   d. Contact ovens
Lesson 5 Objectives:

Upon completion of Lesson 5 training, each new employee will be able to identify the function of contact heaters and the forming station.

Upon completion of Lesson 5 training, each new employee will be able to describe the process of Thermoforming.

1. Plugs are used to:
   a. Fill a leaky cup
   b. Cool web material
   c. Sterilize the inside of the cup
   d. Pre-form the bodystock into cups

2. Which of the following does NOT play a part in the Thermoforming process?
   a. Sterile tunnel
   b. The bodystock
   c. Contact heaters
   d. Compressed air

3. What is sensed to determine if a cup has holes:
   a. Air pressure
   b. Cup thickness
   c. Water pressure
   d. Steam pressure

4. When does the machine stop when holes are detected?
   a. When first discovered
   b. After the air supply valves open
   c. When the signal is sent to the PLC
   d. Once the set is advanced out of the form station

5. Another term for “holes” is:
   a. Gap
   b. Flaw
   c. Break
   d. Leakage
Lesson 6 Objectives:

Upon completion of Lesson 6 training, each new employee will be able to identify the function of the web sterilizer and the lid sterilizer.

Upon completion of Lesson 6 training, each new employee will be able to identify and to describe the function of the parts and controls for the web sterilizer and the lid sterilizer.

1. The web sterilizer sterilizes:
   a. Top of the body stock
   b. Bottom of the body stock
   c. Top and bottom of the body stock
   d. Top and bottom of the web material

2. What does the “Sterilization head” (or “web chamber”) of the web sterilizer do?
   a. Stop body stock from sticking
   b. Senses if steam pressure drops
   c. Encloses steam supply channels to each cup
   d. Regulates steam pressure for filter sterilization

3. Which component of the lid sterilizer stops the machine if pressure is not met?
   a. Steam regulator
   b. Steam pressure sensor
   c. Sterilization steam pressure gauge
   d. Chamber set steam pressure gauge

4. What is the minimum time steam is injected to kill surface bacteria?
   a. .07 seconds
   b. .17 seconds
   c. .27 seconds
   d. .77 seconds

5. In the lid stock sterilization process, the steam pressure should read how many bar higher than the sterilization steam pressure:
   a. 2
   b. 3
   c. 4
   d. 5
Lesson 7 Objectives:

Upon completion of Lesson 7 training, each new employee will be able to identify and describe the function and the controls for the fillers.

1. Single flavor pudding runs on which filler and nozzle plate:
   a. Gel nozzle plate and filler 2
   b. Pudding nozzle plate and filler 1
   c. Pudding nozzle plate and filler 2
   d. Pudding nozzle plate and both filler 1 & 2

2. Why does the inlet gemu valve open first, when starting the fill cycle?
   a. To open pathway to the cups
   b. To draw product into the cylinders
   c. To force product out of the cylinders
   d. To allow sterile air into the oven pressure chamber

3. What keeps the piston guide shafts sterile?
   a. Steam barriers
   b. Filler nozzle plate
   c. Gemu diaphragm
   d. Overpressure chamber

4. On the filler body, condensate relief valves are located on the:
   a. Bottom only
   b. Top of filler & sides
   c. Sides & bottom of filler
   d. Top & bottom of the filler
Lesson 8 Objectives:

Upon completion of Lesson 8 training, each new employee will be able to identify the function of the side sealer and sealing station.

Upon completion of Lesson 8 training, each new employee will be able to identify and to describe the function of the parts and controls for the edge sealer and sealing station.

1. Side sealers have three components, which of the following is NOT one of the components?
   a. Ring seal
   b. Sealing strips
   c. Thermocouples
   d. Pneumatic cylinder

2. What happens in the Seal Station?
   a. Welding occurs
   b. Fills cup with product
   c. Cup is sealed to the lid web
   d. Edging of the webbing is sealed

3. Which of the following is part of the Hassia’s sterile zone?
   a. Form station
   b. Side station
   c. Seal station
   d. Web Advance

4. The sealing pressure in the Seal station can be adjusting by altering the ____________ of the two pneumatic cylinders:
   a. Seal Mold
   b. Air pressure
   c. Water pressure
   d. Steam Pressure
Lesson 9 Objectives:

Upon completion of Lesson 9 training, each new employee will be able to identify and to describe the function of the components for the web advance and the punch station.

1. Which part(s) of the punching tool has a water cooling system?
   a. None
   b. Top only
   c. Bottom only
   d. Top & bottom

2. When you are working on the punch station, what needs to be placed between the mask and mold?
   a. A block
   b. A crank
   c. Your hand
   d. Holding gripper

3. What can be compromised if the punch cut is off center?
   a. The seal
   b. The mold
   c. The mask
   d. The pressure

4. The punch moves in what direction to position itself for the cut?
   a. Left to right
   b. Right to left
   c. Back to front
   d. Front to back
Lesson 10 Objectives:

Upon completion of Lesson 10 training, each new employee will be able to identify the function and location of the scissor station and the walking beam.

Upon completion of Lesson 10 training, each new employee will be able to identify and to describe the function of the parts for the scissor station and the walking beam.

1. Which of the following is another name for the Walking Beam:
   a. SPC control
   b. Belt conveyor
   c. Pneumatic cylinder
   d. Lifting rail discharge

2. What happens after a punching stroke is completed?
   a. Drive transmission release the drive roller
   b. Cuts the residue waste stripping into pieces
   c. Cutting knife is moved by the pneumatic cylinder
   d. Webbing pushes the punched out cups onto the transfer slide

3. Waste is transported away by the:
   a. Drive roller
   b. Roller chain
   c. Web advance
   d. Belt conveyors

4. The Scissor Station has the following parts, except:
   a. Guillotine
   b. Air cylinder
   c. Servo motor
   d. Upper & lower rollers
Lesson 11 Objectives:

Upon completion of Lesson 11 training, each new employee will be able to identify and to describe the purpose of sterilization.

Upon completion of Lesson 11 training, each new employee will be able to identify and to describe the difference in sterilization of the filters (C-1), the filler (C-2) and the tunnel (C-3).

1. Hassia filler achieves total system sterilization in 3 separate stages, which are:
   a. A, B, C
   b. A, B, D
   c. A, C, D
   d. B, C, D

2. Filler sterilization process is called?
   a. C1
   b. C2
   c. C3
   d. C4

3. Where does the sterile zone end?
   a. Filler
   b. Tunnel
   c. Seal station
   d. Web advance
Lesson 12 Objectives:

Upon completion of Lesson 12 training, each new employee will be able to demonstrate an understanding of CIP: cycles, times, and chemical concentrations.

Upon completion of Lesson 12 training, each new employee will be able to perform a CIP Process.

Upon completion of Lesson 12 training, each new employee will be able to demonstrate an understanding of the different CIP's and their respective flow paths.

1. What is a CIP (Clean In Place)?
   a. Automated acid cleaning
   b. Automated chemical cleaning
   c. Hand washing of filler in place
   d. Automated fresh water cleaning

2. When is a double CIP required?
   a. When down for 48 hours
   b. When there is a planned turn
   c. When switching from a dairy product to a non-dairy product
   d. When switching from an allergen product to a non-allergen product

3. What are the two types of CIPs?
   a. Full & Fresh
   b. Sanitizing & Acid
   c. Full & Caustic Only
   d. Caustic Only & Fresh

4. Where does the most common Loss of Sterility come from?
   a. Black specks
   b. Product leakage
   c. By pressing an e-stop
   d. Finding foreign objects
Title: Evaluation of the current Filler Hassia Training at the Menomonie Wisconsin Swiss Miss facility of ConAgra Foods Inc.

Investigator:
Kati Diaz, 715/232-0304, Kathleen.diaz@conagrafoods.com

Research Sponsor:
Dr. David Johnson, 715/232-2143, johnsondav@uwstout.edu

Description:
The objective of this field problem will focus on the effectiveness of the filler training that is being provided to new employees in the Hassia (pudding; lines 1, 2 and the new line 3) department and to provide recommendations to the management staff based on the findings. Recommendations that will arise from this field problem will centered around how to improve the current training and how to enhance it to meet the learning styles of the adult trainees. The significance of this field problem will be to ensure that the training that is provided to new employees meets the learning style needs of these employees. It will also ensure that there are as many of the different learning styles as possible are presented in the training for a comprehensive training program and comprehensive understanding.

Risks and Benefits:
I am sure that some employees will feel like their job is at risk if they do not "pass" this tests, possibly causing some psychological or emotional issues. In addition, it is a possibility that their self-respect could be hindered, in their mind. I feel that the majority of employees trust and respect me and I will do my best to assure them that they are purely helping me out with obtaining my masters degree and in no way will it affect them or their employee with the company. I will reassure them at the time of asking them to participate, at test time, as well as when all tests are complete (if they would like to see the results). The benefits of doing such a field study would to ensure that all persons are given the training in the style that best fits their learning needs to help them succeed with their employment at ConAgra Foods/Swiss Miss.

Time Commitment and Payment:
Each testing session should take less than 2 hours, however if more time is desired, that is permissible. You will be compensated your hourly rate for anytime spent testing these tests, however there will be no other payment outside of your hourly rate for participation.

Confidentiality:
Your name will not be included on any documents. We do not believe that you can be identified from any of this information. This informed consent will not be kept with any of the other documents completed with this project.
Right to Withdraw:
Your participation in this study is entirely voluntary. You may choose not to participate without any adverse consequences to you. Should you choose to participate and later wish to withdraw from the study, you may discontinue your participation at this time without incurring adverse consequences.

IRB Approval:
This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

Investigator: Kati Diaz,  
715/232-0304, kathleen.diaz@conagrafoods.com

Advisor: Dr. David Johnson,  
715/232-2143, and johnsondav@uwstout.edu

IRB Administrator  
Sue Foxwell, Director, Research Services  
152 Vocational Rehabilitation Bldg.  
UW-Stout  
Menomonie, WI 54751  
715-232-2477  
foxwells@uwstout.edu

Statement of Consent:
By completing the following test you agree to participate in the project entitled, “Evaluation of the current Filler Hassia Training at the Menomonie Wisconsin Swiss Miss facility of ConAgra Foods Inc.”

Signature........................................................................................................... Date
Date: ____________

I would like to take this opportunity to thank you for taking the time to complete this evaluation. Participating in this evaluation should take no more than one hour. Please be assured that by no means will this test affect your employment with Swiss Miss/ConAgra Foods. By completing this test, you will contribute to the evaluation of the current training system in the Hassia department, as well as help me to complete my thesis requirement for my masters program at UW-Stout. All tests will remain confidential and in my possession at all times. Participating in this test is completely optional, you will be paid your hourly rate for participating; however you will not receive any additional compensation.

Multiple Choice Format

Questions 1 through 48 are multiple choice format questions and there is only one correct answer for each question.

1. Our quality objective is:
   a. To produce shippable products
   b. “Right the First Time” with “Zero Defects”
   c. Job security comes from a quality product
   d. “Treat customer’s product as if they were your own”

2. There are many reference manuals available, which one describes what to do to prevent foreign material?
   a. Safety Information Boards
   b. PQM – Product Quality Monitoring
   c. GMP – General Manufacturing Procedures
   d. HACCP – Hazard Analysis & Critical Control Points

3. Which of the following control page’s function is used to activate/deactivate the station?
   a. Channel
   b. Counter
   c. Control monitor
   d. Parameter monitor
4. Which of the following is NOT a room within the Hassia department?
   a. Silo Room
   b. Filler Room
   c. Hassia Testing Area
   d. Chemical Storage Area

5. Safe Practices define:
   a. The Key Concepts of Safety
   b. The Swiss Miss Safety Vision
   c. Acceptable Behavior while at work
   d. The Swiss Miss Mission Statement

6. Which of the following is a safety principle?
   a. Accidents happen
   b. Accidents are avoidable
   c. Safety is your responsibility
   d. Safety is not something to be concerned about

7. What is a work request?
   a. Order of needed supplies
   b. The schedule I want to work
   c. Description of a repair for maintenance
   d. Used in maintaining an accurate inventory

8. What is a work order?
   a. Assigns work
   b. Checks inventory
   c. Parts check out & assigns work
   d. Assigns employee to work station

9. Which of the following is the MP2 program NOT intended to do?
   a. Ordering
   b. Track repairs
   c. Maintain inventory
   d. Schedule Preventive maintenance

10. Which of the following does NOT describe a confined space:
    a. Requires a permit for entry
    b. Is designed for continuous occupancy
    c. There are limited means for entry/exit
    d. Configured so an employee can bodily enter
11. Which of the following does NOT play a part in the Thermoforming process?
   a. Sterile tunnel
   b. The bodystock
   c. Contact heaters
   d. Compressed air

12. Filler sterilization process is called?
   a. C1
   b. C2
   c. C3
   c. C4

13. Plugs are used to:
   a. Fill a leaky cup
   b. Cool web material
   c. Sterilize the inside of the cup
   d. Pre-form the bodystock into cups

14. What are the two types of CIPs?
   a. Full & Fresh
   b. Sanitizing & Acid
   c. Full & Caustic only
   d. Caustic only & Fresh

15. What is sensed to determine if a cup has holes:
   a. Air pressure
   b. Cup thickness
   c. Water pressure
   d. Steam Pressure

16. When does the machine stop when holes are detected?
   a. When first discovered
   b. After the air supply valves open
   c. When the signal is sent to the PLC
   d. Once the set is advanced out of the form station

17. The web sterilizer sterilizes:
   a. Top of the body stock
   b. Bottom of the body stock
   c. Top and bottom of the body stock
   d. Top and bottom of the web material
18. What does the “Sterilization head” ("web chamber") of the web sterilizer do?
   a. Stop body stock from sticking
   b. Senses if steam pressure drops
   c. **Encloses steam supply channels to each cup**
   d. Regulates steam pressure for filter sterilization

19. Where does the most common Loss of Sterility come from?
   a. Black specks
   b. **Product leakage**
   c. By pressing an e-stop
   d. Finding foreign objects

20. Which of the following is NOT servo-controlled?
   a. Filler
   b. Plug assists
   c. Web advance
   d. **Contact ovens**

21. The Scissor Station has the following parts, except:
   a. Guillotine
   b. Air cylinder
   c. **Servo motor**
   d. Upper & lower rollers

22. Why does the inlet gemu valve open first, when starting the fill cycle?
   a. To open pathway to the cups
   b. **To draw product into the cylinders**
   c. To force product out of the cylinders
   d. To allow sterile air into the oven pressure chamber

23. What is the minimum time steam is injected to kill surface bacteria?
   a. .07 seconds
   b. .17 seconds
   c. .27 seconds
   d. .77 seconds

24. What keeps the piston guide shafts sterile?
   a. Steam barriers
   b. Filler nozzle plate
   c. Gemu diaphragm
   d. Overpressure chamber
25. Single flavor pudding runs on which filler and nozzle plate:
   a. Gel nozzle plate and filler 2
   b. Pudding nozzle plate and filler 1
   c. Pudding nozzle plate and filler 2
   d. Pudding nozzle plate and both filler 1 & 2

26. What happens after a punching stroke is completed?
   a. Drive transmission release the drive roller
   b. Cuts the residue waste stripping into pieces
   c. Cutting knife is moved by the pneumatic cylinder
   d. Webbing pushes the punched out cups onto the transfer slide

27. Lockout/tagout means to:
   a. Shutdown a machine
   b. Clock out at break time
   c. Disconnect equipment from energy source
   d. Stopping a machine to perform maintenance

28. Side sealers have three components, which of the following is NOT one of them?
   a. Ring seal
   b. Sealing strips
   c. Thermocouples
   d. Pneumatic cylinder

29. Which component of the lid sterilizer stops the machine if pressure is not met?
   a. Steam regulator
   b. Steam pressure sensor
   c. Sterilization steam pressure gauge
   d. Chamber set steam pressure gauge

30. What happens in the Seal Station?
   a. Welding occurs
   b. Fills cup with product
   c. Cup is sealed to the lid web
   c. Edging of the webbing is sealed

31. Waste is transported away by the:
   a. Drive roller
   b. Roller chain
   c. Web advance
   d. Belt conveyors
32. The following are e-stop locations on the H1 & H2 Fillers, except:
   a. At web roll area
   b. On control panel
   c. At discharge end
   d. The web sterilizer

33. Which of the following is another name for the Walking Beam:
   a. SPC control
   b. Belt conveyor
   c. Pneumatic cylinder
   d. Lifting rail discharge

34. Hassia filler achieves total system sterilization in 3 separate stages, which are:
   a. A, B, C
   b. A, B, D
   c. A, C, D
   d. B, C, D

35. What is a CIP (Clean In Place)?
   a. Automated acid cleaning
   b. Automated chemical cleaning
   c. Hand washing of filler in place
   d. Automated fresh water cleaning

36. The punch moves in what direction to position itself for the cut?
   a. Left to right
   b. Right to left
   c. Back to front
   d. Front to back

37. When is a double CIP required?
   a. When down for 48 hours
   b. When there is a planned turn
   c. When switching from a dairy product to a non-dairy product
   d. When switching from an allergen product to a non-allergen product

38. Which of the following is part of the Hassia’s sterile zone?
   a. Form station
   b. Side station
   c. Seal station
   d. Web Advance
39. What can be compromised if the punch cut is off center?
   a. The seal
   b. The mold
   c. The mask
   d. The pressure

40. On the filler body, condensate relief valves are located on the:
   a. Bottom only
   b. Top of filler & sides
   c. Sides & bottom of filler
   d. Top & bottom of the filler

41. If you replaced a pump gasket, how would you document it?
   a. On a work order
   b. On a work request
   c. In the MP2 program
   d. E-mail the maintenance lead

42. Another term for “holes” is:
   a. Gap
   b. Flaw
   c. Break
   d. Leakage

43. In the lid stock sterilization process, the steam pressure should read how many bar(s) higher than the sterilization steam pressure?
   a. 2
   b. 3
   c. 4
   d. 5

44. Where does the sterile zone end?
   a. Filler
   b. Tunnel
   c. Seal station
   d. Web advance

45. The sealing pressure in the Seal station can be adjusting by altering the 
   _____________ of the two pneumatic cylinders:
   a. Seal Mold
   b. Air pressure
   c. Water pressure
   d. Steam Pressure
46. There are how many auxiliary control panels on the Hassia?
   a. 5
   b. 6
   c. 7
   d. 8

47. Which part/s of the punching tool has a water cooling system?
   a. None
   b. Top only
   c. Bottom only
   d. Top & bottom

48. When you are working on the punch station, what needs to be placed between the mask and the mold?
   a. A block
   b. A crank
   c. Your hand
   d. Holding gripper
Filler Task Listing

1. Filler Start Up
   - Start up from complete shut down

2. Clean in Place (CIP) & Clean out of Place (COP)
   - Prepare for CIP
   - Perform CIP
   - Prepare for COP
   - COP
   - Misc. cleaning tasks

3. Production Preparation
   - Prepare and thread body stock
   - Prepare and thread lid stock

4. Sterilize the Filler
   - Sterilize the Filters (C-1)
   - Sterilize the Filler(s) (C-2)
   - Sterilize the Tunnel (C-3)

5. Production Start
   - Start production
   - Code change
   - Sterile changeover
   - Tunnel only sterilization
   - Temporary shutdowns
   - Splicing body and lid stock
   - Change Yokogawa chart paper and printer ribbon

6. Shut Down Production
   - Shut down production
7. Product Quality Monitoring (PQM)

- Net Weights
- Hold procedure
- pH
  1. Set up and calibrate
  2. Perform the test
- Viscosity: Swiss Miss Pudding
  1. Set up and calibrate
  2. Perform the test
- Viscosity: Snack Pack
  1. Set up and calibrate
  2. Perform the test

- Fill temperature
- Organoleptic Test (Sensory Evaluation)
- Bead drain weight for Tapioca (Particulate Determination)
- Bostwick

For gel production

- Brix Test
- Gel Strength Test
### Appendix E

**PRE-TEST:**

176/384 = 46%

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
</tbody>
</table>

**Total:**

4 7 8 7 4 0 0 4 1 55 6

5/24 = 21%

25/40 = 63%

15/32 = 47%

---

**PRE-TEST:**

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
</tbody>
</table>

**Total:**

8 4 2 4 0 2 7 2 6 3 8 8 6

10/24 = 42%

25/40 = 63%

9/40 = 23%
<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION:</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>38</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>2</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total:**

13/32 = 41%

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION:</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>31</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>33</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>34</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>44</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total:**

17/32 = 53%

**PRE-TEST**

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION:</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>37</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>37</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total:**

21/32 = 66%

**PRE-TEST**

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>QUESTION:</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>37</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>14</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total:**

16/32 = 50%
### POST-TEST

#### LESSON: 1

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>10</th>
<th>27</th>
<th>32</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>41</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 2 9 10 10 7 0 0 0 0 0 5 8 7

9/30 = 30%
33/50 = 66%
20/40 = 50%

#### LESSON: 2

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>3</th>
<th>20</th>
<th>46</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>16</th>
<th>42</th>
<th>17</th>
<th>18</th>
<th>23</th>
<th>29</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 8 3 2 0 0 4 4 2 5 3 4 10 9

16/30 = 30%
40/50 = 80%
19/50 = 38%

#### LESSON: 3

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>41</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 2 9 10 10 7 0 0 0 0 0 5 8 7

9/30 = 30%
33/50 = 66%
20/40 = 50%

#### LESSON: 4

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>3</th>
<th>20</th>
<th>46</th>
<th>11</th>
<th>13</th>
<th>15</th>
<th>16</th>
<th>42</th>
<th>17</th>
<th>18</th>
<th>23</th>
<th>29</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 8 3 2 0 0 4 4 2 5 3 4 10 9

16/30 = 30%
40/50 = 80%
19/50 = 38%
<table>
<thead>
<tr>
<th>LESSON:</th>
<th>POST-TEST</th>
<th>POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUESTION:</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>38</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td>0 3 8 6 5 0 7 2 4</td>
<td>0 2 7 0</td>
</tr>
<tr>
<td></td>
<td>23/40 = 58%</td>
<td>26/40 = 65%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LESSON:</th>
<th>POST-TEST</th>
<th>POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUESTION:</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>W</td>
</tr>
<tr>
<td>3</td>
<td>31</td>
<td>W</td>
</tr>
<tr>
<td>4</td>
<td>33</td>
<td>W</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>W</td>
</tr>
<tr>
<td>6</td>
<td>34</td>
<td>W</td>
</tr>
<tr>
<td>7</td>
<td>44</td>
<td>W</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>W</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>W</td>
</tr>
<tr>
<td>10</td>
<td>35</td>
<td>W</td>
</tr>
<tr>
<td>Total:</td>
<td>6 1 0 0 6</td>
<td>23/30 = 77%</td>
</tr>
<tr>
<td></td>
<td>33/40 = 83%</td>
<td>33/40 = 83%</td>
</tr>
</tbody>
</table>