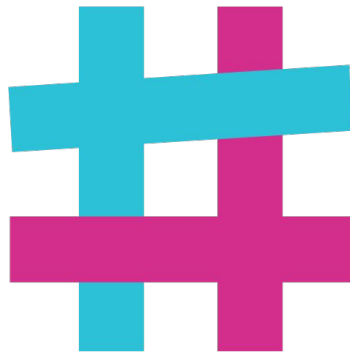


The



**Duct
Tape
Network**

Guidebook

The Duct Tape Network Guidebook

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Welcome to the Duct Tape Network!

We are so happy that you are going to lead a Duct Tape Network (DTN) Club!

This guide includes information to help you get a DTN Club started in your community.



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Introduction



What is DTN?

The Duct Tape Network (DTN) is a **series of fun, hands-on maker clubs** that encourage children (ages 7-11) to use cardboard, tape, wood, fabric, LED lights, motors, and more to **bring their stories and inventions to life**.

DTN gives young people the increasingly rare opportunity to build things that they care about. And, in the process, have fun, get excited, and work with friends.

DTN is about transforming ordinary spaces into extraordinary creativity spaces (for an afternoon, morning, or evening). It is about using low-cost, easy-to-access, everyday materials to get young people making and collaborating immediately.

DTN clubs include a lot of **tinkering time** complemented by skill building, collaboration, and reflection.

We are so glad to have you join us as a DTN facilitator!



Why is DTN important?



- We live in a society that is marked by change and unpredictability.
- The world today expects high levels of **flexible thinking, adaptation, and innovation.**
- Kids who practice risk-taking, mindfulness, adaptability, and collaboration build a foundation for these skills to develop throughout their lives.
- People need to be **creative** and **collaborative** problem-solvers in order to succeed in today's ever changing society and workforce.
- DTN creates opportunities for kids to practice these skills, explore their imaginations, tinker with their hands, and engage in creating meaningful, open-ended projects.

How is DTN different?

The maker movement has taken off and there are many maker-oriented education programs. What makes DTN special?

- We specifically target a younger age: 7-11.
- We believe in providing young people with as much **open-ended, creative freedom** as possible. We have tested ways to quickly create **pop-up creativity-spaces** that get kids making immediately.
- Our programs give children the opportunity to dive into the design process. We encourage children to experiment, to wonder, and to question. Our facilitators use questions, inspirational images, and project examples to help in this process.
- We believe the **making process** is important. We want kids to explore materials, see how things work, and tinker regardless of whether this exploration results in a finished product.
- DTN believes in **accessibility**. We want kids to experience making wherever they are. We emphasize low-cost, low-threshold, everyday materials.

Curriculum Philosophy

DTN was inspired by the philosophy of the "4 Ps of Creative Learning," an educational approach proposed by Mitchel Resnick of the Massachusetts Institute of Technology's Lifelong Kindergarten Project [1]. Keep these in mind as you set up your space and work with kids:

- **Projects.** People learn best when they are actively working on meaningful projects – generating new ideas, designing prototypes, refining iteratively.
- **Peers.** Learning flourishes as a social activity, with people sharing ideas, collaborating on projects, and building on one another's work.
- **Passion.** When people work on projects they care about, they work longer and harder, persist in the face of challenges, and learn more in the process.
- **Play.** Learning involves playful experimentation – trying new things, tinkering with materials, testing boundaries, taking risks, iterating again and again.

[1] Resnick, M (2017). *Lifelong Kindergarten: Cultivating Creativity through Projects, Passion, Peers, and Play*. MIT Press.

Getting Started



Your Mission as a Facilitator

As a facilitator, your role is to encourage kids to make projects based on their own ideas (rather than following the steps of a recipe). The way you set up your space, the materials and example images you provide, your own energy all contribute to this! When we start a new DTN club, we tell our participants:

The world needs more creative thinkers, problem solvers, and makers! In anything you want to do in the future, these are critical skills! We want you to create and think with:

- **YOUR Head** -- Make projects based on YOUR ideas. Design something. Collaborate with friends. Stretch your brain.
- **YOUR Hands** -- Make things with YOUR fingers. Tinker with new materials or play with familiar materials in new ways.
- **YOUR Heart** -- Make something that you care about.

Participants

DTN Clubs are designed for groups of 8-12 kids ages 7-11, but can be adapted to fit the needs of your team.

Participants might already be in an after-school club, Girl or Boy Scout troop, neighborhood association, or be participating in after-school enrichment activities at their school or library. Clubs might even meet in a facilitator's garage!

To ensure consistent participation, we suggest facilitators provide a sign-up in advance of the DTN program start date. DTN Clubs often work best when there is a host organization that can help to promote and provide certain structures (forms, registration, etc.).



Your Role

Your role is to run DTN Clubs in your community! We provide a 7-week curriculum as a starting point, however we encourage you to adapt the curriculum to fit the needs and interests of your community. DTN can be modified to run as a workshop, a 4-week program, or even as a year-long club! We hope DTN Clubs will continue long after the 7 weeks!

We recommend 2 facilitators for every 10-12 kids.

As a facilitator, you:

- Secure the weekly space for your DTN Club to meet
- Provide and organize all supplies
- Plan and facilitate weekly sessions
- Communicate with families



Is DTN Right for you?

DTN facilitators love working with kids and making things!

This is the right role for you if you:

- Have 3-4 hours per week to plan, facilitate, and document your DTN Club
- Have a strong interest and commitment to provide creative learning experiences to young people
- Like to have fun! Ideal facilitators will bring their own playful and creative energy with them

(Depending on your location and your affiliation with the location, you may need to complete additional applications or perform background/CORI checks before working with kids.)



The Space



As a DTN facilitator you are likely **transforming an ordinary space** into an **extraordinary creativity space**. Your space might be a table in the children's room of the library, a classroom with desks, a kitchen table, a conference room, or a garage. Well-organized materials help you quickly set-up/clean-up for your club meeting.

Open Studio Approach: Stations

The wonderful challenge for the DTN facilitator is to transform ordinary spaces into **Open Studio/Creativity Spaces** where kids are invited and encouraged to tinker, share ideas, and build things that they care about.

Create distinct **stations** for materials and activities in the same location each week so that kids know what to expect when they enter the space and can get started making right away. Depending on the space, you may need to combine multiple stations on the same tables.



Recommended Stations

- ❑ **Check-in Table:**
Toolkits
- ❑ **Inspiration Wall**
- ❑ **Common Materials**
- ❑ **Materials of the Day**
- ❑ **Documentation Station**
- ❑ **Glue Station (Optional)**

What Happens at Each Station

- ❑ **Check-in Table:** Kids pick up individual toolkits and check in with facilitator or have a quick group meeting.
- ❑ **Inspiration Wall:** Displayed in entrance of room with images that relate to the theme or materials of the day. These images then can be transferred into a binder to use as an inspiration book for future sessions. If space is limited, perhaps you just want to have inspiration images in a scrapbook for kids to flip through.
- ❑ **Common Materials:** We recommend organizing all your materials in shallow, plastic bins that can be stacked and transported on a rolling cart. Each bin should be clearly labelled. Supplies should be in individual containers and bags for easy access and clean up (for example a container for googly eyes, a bag for pipe cleaners) *See Supplies and Materials Section for complete list.*
- ❑ **Materials of the Day:** Any day-specific materials (wood, fabric, LEDs) arranged in shallow bins. We recommend keeping any electronics used (motors, LED lights, and batteries) in separate containers.
- ❑ **Documentation Station:** Create a space where kids' projects can be photographed.
- ❑ **Glue Station:** Disposable tablecloth for surface, powerstrip, glue guns and extra glue, gloves to prevent burns (safety instruction and rules needed). (Note: Hot glue guns are optional!)

The DTN Structure



DTN Clubs Format

Each DTN club has its own distinct style. We encourage you to find the structure and the pace that works for your participants and location. Suggested daily plan:

- **Getting Started:** Each week participants start the session by picking up their toolkit and taking a look at the images on the **inspiration wall or book**.
- **Group Check-in:** If time permits, start with a quick group check-in to introduce any **Materials of the Day**, safety concerns, or reflect on ideas from the last session. This is also the time to introduce theme and tip cards for the day.
- **Start MAKING in the Open DTN Studio** by:
 - Experimenting with Materials of the Day
 - Continuing project from week before (kids are always free to do this without exploring the Materials of the Day)
 - Getting inspiration from:
 - TIP cards
 - Inspiration wall
 - Themes
 - Guided support on new material of the day
- **Skill or Concept of the Day:** Some kids will delve right in without any support. Some might want some guidance. One facilitator might work with a small group to introduce a material (wood, LED) or concept (fastening cardboard together).

A Sample DTN Club Meeting

Welcome: Pick up Tool Kits and Check in (5 minutes)
Open Studio (45 minutes total)
Cleanup (5 minutes)
Reflect and Share (5-10 minutes)

Your First DTN Club Meeting

You can start your DTN Club any way that you like! We recommend that your first meeting be the most structured so you can get kids working together, introduce materials, goals, safety issues etc, and most importantly, set the tone for the weeks to follow.



Sample First Day Outline

- Welcome and introductions
- Creative Team Building Activity: Give teams a limited amount of time to construct something using ordinary materials. For example: newspaper towers, gumdrops & toothpicks construction, paper cup castle. The goal of this activity is to get kids creating right away!
- Introduce goals of DTN connected to the creative making that happened during the team activity
- Review space and safety concerns
- Make and personalize toolkits and journals
- Make a take home project! We feel that it's important for kids to make something relatively quickly that they can take home the first day. LEDs and simple craft materials lend themselves to this type of project. For example:
 - Creating a name badge with an LED light
 - Magic wand or flashlight with LED

Overview of a 7-week DTN Club

This is an example of a 7-week DTN after school program for 3rd and 4th graders. This club meets for an hour once a week over the span of 7 weeks.

Day 1: DTN Overview and Getting Started

Introductions, creative building team activity, make your own toolkit and journal, take-home projects

Day 2: Cardboard Boxes

Themes: Toys and games, future houses

Day 3: Craft and Motors

Themes: Gardens of the future, 3-D Creatures

Day 4: Wood

Themes: Toys and structures, using thread and string

Day 5: Studio Time

Open studio time

Day 6: Studio Time

What can you make to engage your families in DTN

Day 7: Creativity Festival/Open House

Share projects with families. Engage families in making something.

DTN Sample Club Meeting Agenda

Day 2: The Making Begins: Cardboard Box Designs

Goals	Ample time to work on own ideas Space for creativity and hands-on work Leave with something they have made
Welcome (5 minutes)	This is the time to set the tone for the day! Begin by introducing the TIP cards, inspiration board images and the Material of the Day: Cardboard . Share the theme suggestions : Toys & Games, Future Houses. Discuss the stations : Common Materials, Materials of the Day, Glue and Documentation stations. Review any safety considerations. If time permits, allow kids to share reflections from previous sessions or ideas for this session.
Open Studio (45 minutes)	Allow ample time for kids to tinker with materials and create projects they care about. Offer optional time with a facilitator focusing on particular skills such as cutting cardboard or attaching pieces together.
Clean-Up (5 minutes)	Kids make notes in their journals then clean up and return toolkits.
Reflect and Share (5-10 minutes)	Allow time for reflection. Volunteers share their reflections about the making process and/or their projects from the day.

Creativity Festival

The Creativity Festival is a time for families or other students to come and see what the DTN makers have created! Since kids like to take their projects home on a weekly basis, we make sure to document their projects and print out photos (or share a slideshow) for the Creativity Festival. We also suggest having hands-on activities that the kids have designed during the Creativity Festival. For example, one club created games during their last session, and at the Creativity Festival, families tested and added to the games! Another club brought in helium balloons and had kids and families experiment with the balloons!



Is It Working? Reflecting on Your Meeting

Chances are, as a facilitator you will know when you have had a great session. Here are some questions you can ask yourself as you reflect on your club meeting and plan for your next!

Did kids have a chance to:

- Get messy
- Try something new
- Be curious and ask questions (wonder)
- Make mistakes
- Collaborate with friends
- Share ideas
- Get a new idea and figure out how to execute it with DTN materials
- Feel good about something they created or experimented with
- Get engaged in making something



Working with Kids

As a DTN facilitator everything you do stems from the participants in your club. The best plan may be derailed if kids are too tired, not engaged, or frustrated. Here are some very basic suggestions that we hope that you will add to over time!

Know Your Audience: If kids are coming to you after school, do they need time to run around or have a snack before starting? What do you need to do to ensure a positive meeting?

Collaboration: DTN works best when kids are naturally working together. Sometimes you may need to play a game to jumpstart collaboration. Sometimes you might ask one child to mentor another.

Creative Processes: Some kids jump right into the making process, while others might need some more one-on-one mentoring with a facilitator or a peer.

Back-up Plan: Always have a plan B in your pocket for when things are not going well (kids too tired, bored, etc). This might be adding in a creative challenge game for everyone or inviting one child to play a game or run around outside.



Supplies and Resources



Personal Toolkits

Personal toolkits are an important ingredient for your DTN club. We recommend that each participant create their own toolkit the first day of the club and that they pick up their toolkit when they arrive each day. This ensures that they have their own scissors, pencils, and journals to use during each club meeting. Often kids will spontaneously use their journals just because they are in the toolkits! Have the kids personalize their toolkits with tape, makers, lights...

This is a recommended list of supplies for a starter toolkit:



- Toolkit case or pouch
- Scissors and/or cardboard cutters
- Pencils and crayons
- Small journal

Add in over time:

- Mini-staplers
- Tape measure or ruler
- Vibration and toy motors (1)
- LED (3)
- Batteries and battery holder

Shared Materials

This is a list of the basic shared materials to start with. We are sure that your list will grow. Most of these materials can be purchased cheaply at office supply stores, craft stores, or are found in your recycling bin!



- ❑ **Tape:** Masking, Duct tape, Scotch tape
- ❑ **Glue:** Glue sticks, hot glue
- ❑ **Scissors** (large)
- ❑ **Hole punchers**
- ❑ **Fasteners:** Brads, rubber bands, staplers, clothespins, paperclips, thumbtacks
- ❑ **Craft supplies:** Googly eyes, pom poms, pipe cleaners, popsicle sticks, pipe cleaners, toothpicks, velcro, string
- ❑ **Cardboard:** Tubes, cartons, boxes
- ❑ **Drawing Materials:** Markers, crayons, permanent markers
- ❑ **Paper:** Construction, drawing paper, wall paper, patterned paper
- ❑ **Misc Items:** Tinfoil, contact paper, plastic bags

Other Materials and Ideas

Materials from Home

Kids are also invited to bring their home projects or materials to the club. For instance, it's ok for them to bring in a T-shirt or a broken toy from home (or special paper, cardboard, balls).

Projects Going Home

We hope that club activities continue at home. Often kids will want to bring their projects home to keep working on them. We encourage this, putting the responsibility on the child to bring the project back (if they want) the following week. We do suggest that you **document** any projects that are going home!

Guest Artists

If you find that your DTN club needs a little inspiration (perhaps halfway through), think about inviting in a guest artist for the day!

Constraining Materials

You may find that having lots of compelling materials is inspiring to some kids, but can overwhelm others. Experiment with constraining materials. For example, one day you might have just popsicle sticks and cardboard and glue!

Support Materials

Some kids arrive at DTN knowing exactly what they want to do and can't wait to get started. Perhaps they want to continue working on a project from the previous week or they have brought in something from home to work on. However, other kids may need some help getting started. DTN TIP cards can be great for offering potential ideas. We like to mention these cards at the introduction times and then leave them sprinkled around on the work tables for kids to read.



DTN Theme
TIP CARD:

Build your dream house
or room.



DTN Theme
TIP CARD:

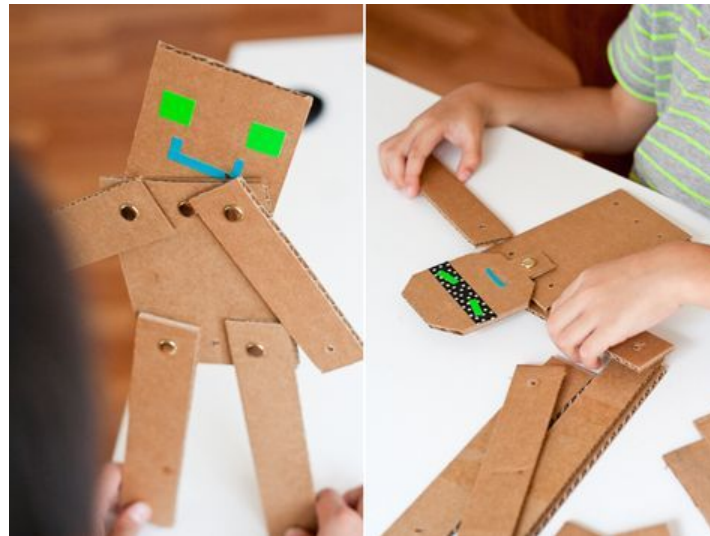
What would houses
of the future look
like?

DTN TIP Card Samples

These cards are used to visually introduce some hints to help kids use the materials of the day. For example, the cards below help kids think about ways to attach cardboard parts using brads. We like using these tip cards because it's an organic way for kids to get support or inspiration.



DTN Material
TIP CARD:



Where to Find Inspiration Online

Design Squad: <http://pbskids.org/designsquad/>

Maker Education: <http://makered.org/>

Artful Parent: <http://artfulparent.com/>

TinkerLab: <http://tinkerlab.com/>

Imagination Foundation: <https://imagination.org/>

The Tinkering Studio: <http://tinkering.exploratorium.edu>

Discovery Museum Maker City blog: <https://www.iexplore.com/blog-1>

Edutopia Maker Education: <https://www.edutopia.org/topic/maker-education>

Create Collaborate Innovate:

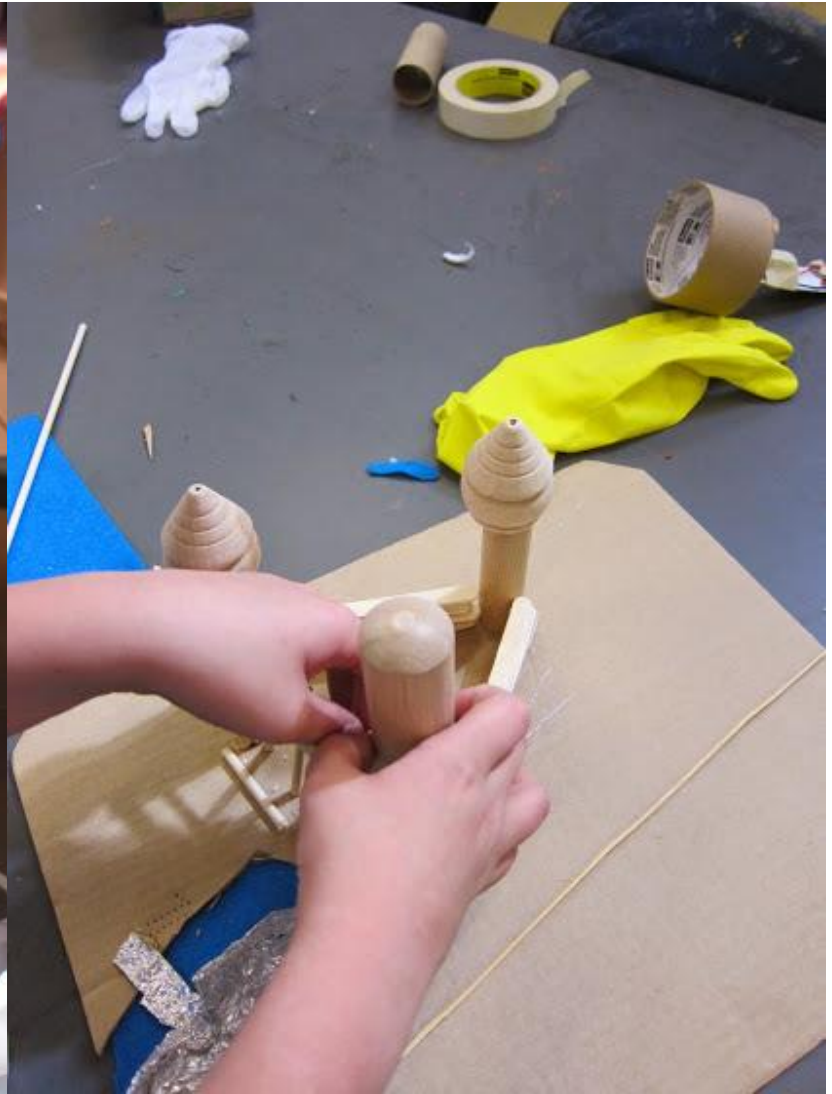
<https://colleengraves.org/makerspace-resources-and-programming-ideas/>

Renovated Learning: <http://www.renovatedlearning.com/blog/>

Open Studio time



The majority of each club gathering is spent in Open Studio time. DTN makers engage in the process of making things that they care about!



DTN makers use a variety of low-cost materials to tinker and build.

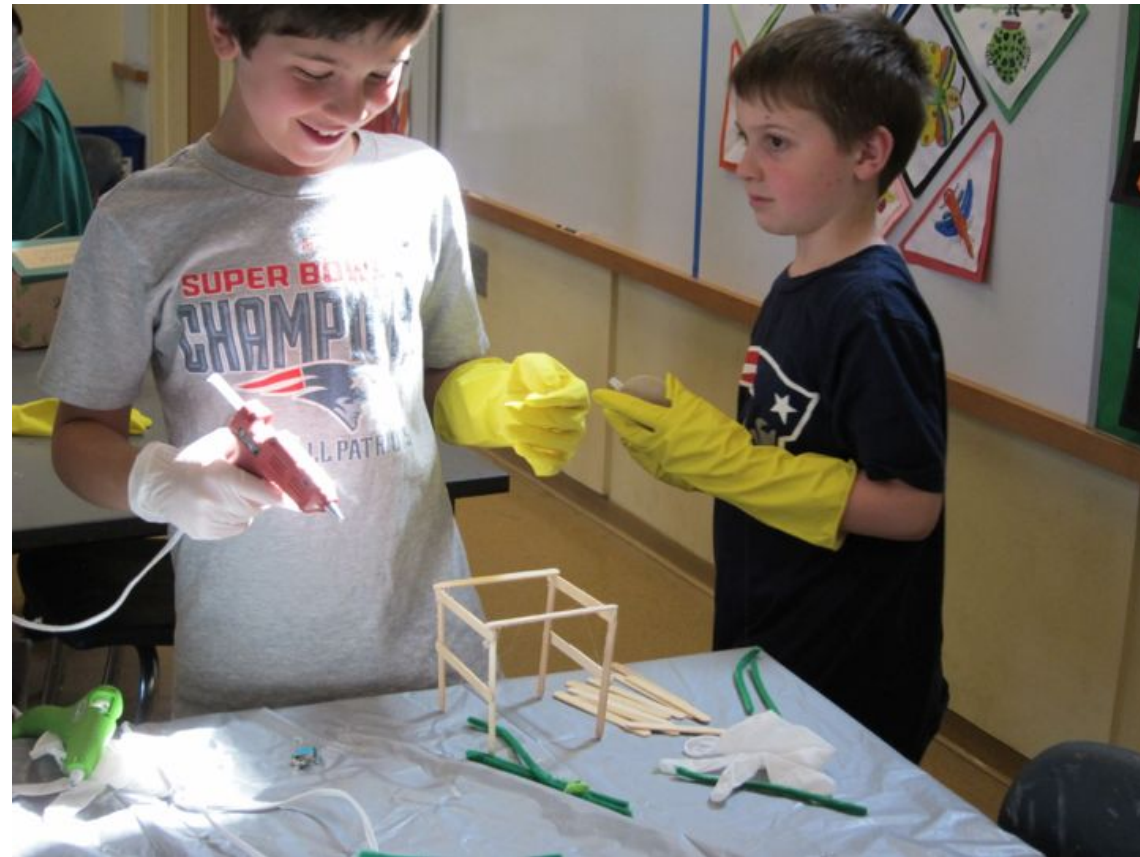


DTN makers find inspiration from the Materials of the Day, the TIP Cards, or their own interests and ideas!



DTN makers sharing their projects.

Wood



DTN makers work together to build houses of the future out of popsicle sticks and other materials.

Cardboard Boxes



DTN makers work together to build a game using cardboard boxes.

Creativity Festival



DTN makers prepare an activity for the Creativity Festival using helium balloons.



Family members test and add to DTN makers' creations during the festival!